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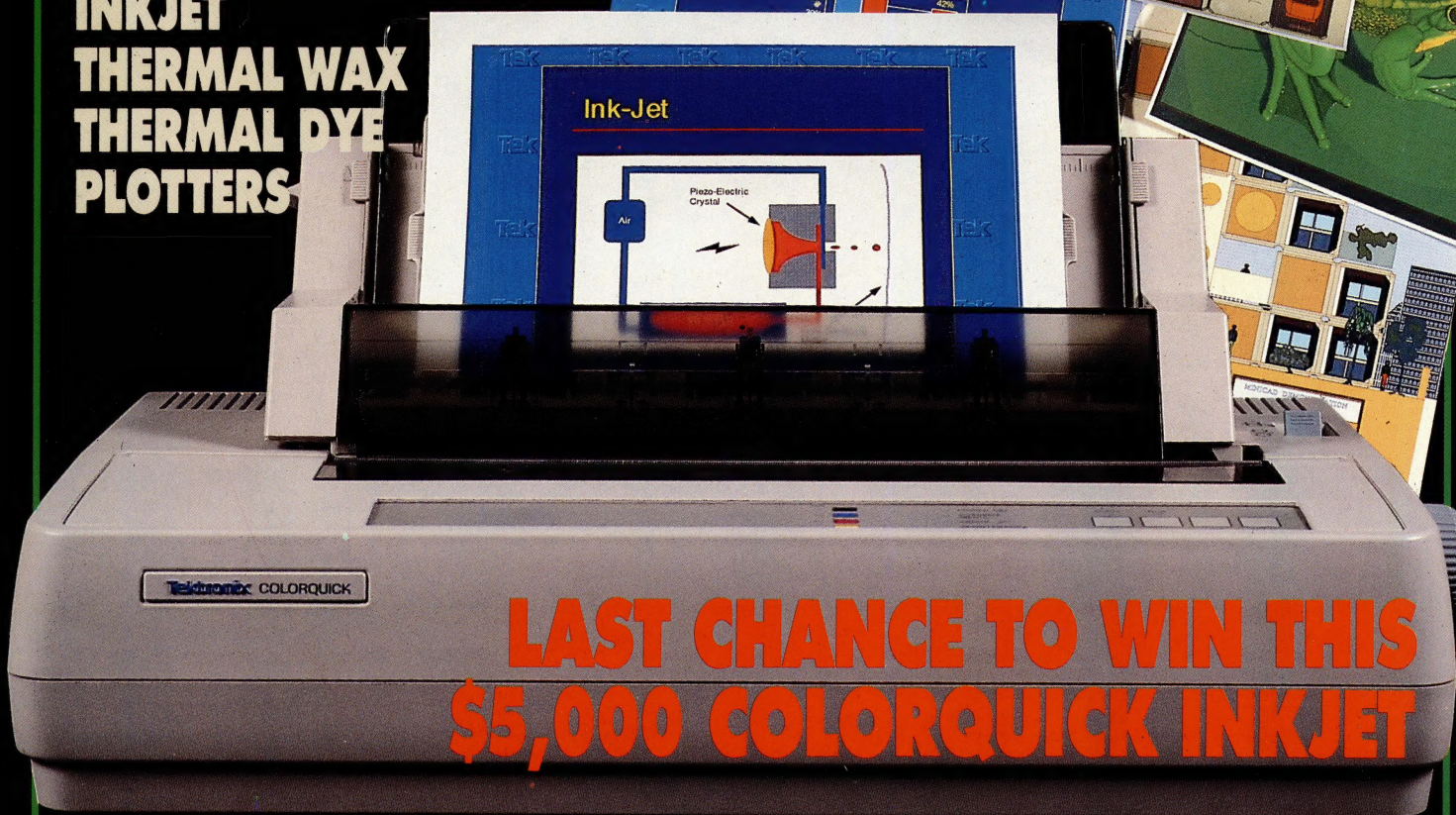
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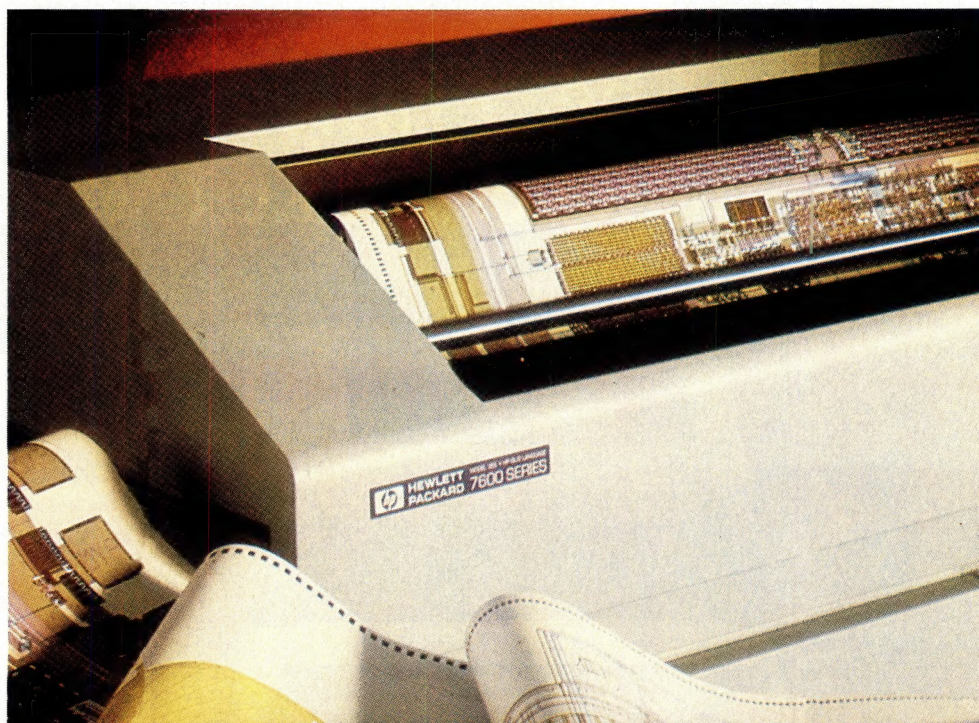
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**COLORING THE 1990s**

**18**



**EMAIL GOES QUICKMAIL**

**44**

**NEXT MONTH INCLUDES**

Most of us find we soon outgrow our PC – we need more memory, a faster CPU, or higher resolution graphics, a color monitor, a MIDI interface or even voice recognition and synthesis. Our annual Add-on Atlas describes the options available and tells how to install a card yourself. For small business users, we also have a selection of speciality packages designed to make the PC a customised productivity tool. And – a tale of corporate and government PC waste. We also have a new 'mystery' columnist who starts with a column on computer columnists (if our legal people will pass it).

***This month's cover:*** A *Your Computer* reader is going to be producing graphics with this ColorQuick inkjet from Tektronix – see page 50!



# CONTENTS

APRIL 1990

## FEATURES

### Coloring the 1990s – Part 2

There's no doubt a color printer can be used to great affect – but there's a price to be paid and a confusing choice of technologies.

### Back up the future!

Reporting on the Seventh Annual Australian Computers in Education Conference, Sharon France found the theme that now is the time for consolidation.

### ColorQuick Giveaway!

Last chance to win a \$5000 Tektronix ColorQuick inkjet!

### FRAM – a RAM that doesn't forget!

Australian-based Ramtron is involved in research which promises to revolutionise computer memory.

### IBM and the PS/2

It's difficult to make much sense of the marketing strategy for the PS/2 range unless you understand IBM's view of the computing environment.

### Australian Defence Force Academy computers

The Australian Defence Force Academy is training their cadets on Macs – with great success, as William Olson discovered.

### Logo or Latin?

Understanding computers will soon be essential for most students hoping to join the work force – but is 'computing' being taught to reflect that?

### Commodore Competition

The trip to the next North American Amiga Software Developer's Conference was won by ...

### Anti-triboelectricity mats

Melbourne-based DSC Management has developed a new product with the potential to save Australia millions of dollars in imports.

## REVIEWS

### A paradox in Paradox 3.0

Steven Keen continues his Database Data series with a product so feature-rich and fast, he can forgive its limitations.

### Email goes QuickMail

For it to be effective, the choice of an electronic mail system needs to be carefully considered.

### Draft Choice

If you're after a combination CAD, graphics and drawing program, Draft Choice is for you.

### QuickPak Professional

John Hepworth has been checking out a library of 400 QuickBasic functions.

### Hard copy

This month *A Concise Introduction to Lotus 1-2-3* and *A Concise Advanced User's Guide to MS-Dos*

## FOR USERS...

### Choosing a wordprocessor

The first software most users want to buy is a wordprocessor, but deciding between the staggering number of packages and vast range of features can be daunting even to experienced users.

### Assembling QuickBasic – Part 10

To ensure that modifications to the interrupt vector tables are restored, QuickBasic provides a facility that will force a particular routine to be run whenever the program terminates.

### Hypertext or just hype – Part 2

Is hypertext the key to the PC's potential, Stewart Fist wonders, or just a curiosity?

### Laptop clinic – Part 6

Tom Moffat describes how to optimise a laptop's LCD display using the attribute byte.

### National BBS Listing

Twit users

### New Products

Printers, processors and a Medical Electronic Desktop ...

### IBM Underground

QEDIT – a shareware text editor for programmers that is unobtrusive and makes it easy to get ideas down on paper without having to wrestle with arcane commands.

### Your Atari

Kult, Tintin and Teenage Queen

### The Forth Column

For real beginners

### Your Apple IIGS

WordPerfect for the GS, a new game from the author of Tetris and the Timeout utility for AppleWorks ...

### Your Amiga

The good, the bad and the weird

### Write bytes

Have your say in YC in our new letters to the editor section. If you've got a PC-related query or a gripe, tell us about it!



# Firsts for the Awards!

**I**T WAS A wet and dismal day, but the occasion was a happy one. YC's Jake Kennedy, Mark Wilde and Mark Cheeseman hosted a congratulatory lunch for Toshiba and Hewlett-Packard executives. Prior to the lunch, James Wright, national marketing manager for Toshiba, and Shailesh Naik, regional sales manager for HP, accepted *Your Computer's* Personal Computer of the Year and Software Product of the Year Awards for their respective companies.

This was the second year running Toshiba won the Award for one of its laptops – the T5200 took the honors in 1988, and the T3100SX, this year – and that's a first in the history of the Awards. In nominating the winner, the judges had commented: 'The T3100SX's low-power, VGA screen is eminently readable; couple that

with Intel's 386SX and a hard disk, and then add battery power – that's a recipe for portable computing of the finest ilk.'

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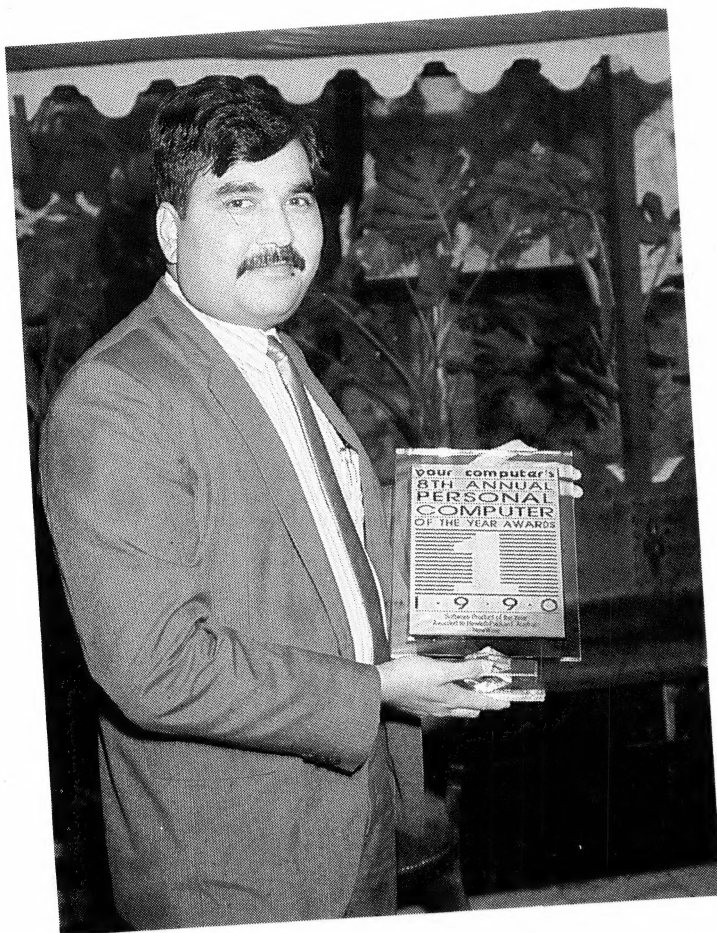
*It also gives a clear indication of where computer technology is heading.*

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Upon accepting the Award, Wright commented: 'We're very proud of the T3100SX. Not only is winning this Award a very significant achievement for us, but it

also gives a clear indication of where computer technology is heading. A few years ago it would have been unheard of for a laptop to beat desktop computers for any award – and now we've done it twice!'

After the presentation, Hewlett-Packard's market development manager, Steve Hitchings, remarked that the Award 'was recognition of the significance of NewWave. After the project to develop precision-based architecture, the development of NewWave was the biggest R&D project the company had ever undertaken.' HP's win this year was another first for the Awards: no company had ever won in both categories before – the HP 110 portable was Computer of the Year in 1985 (and the first portable to win). A complete list of Computer of the Year winners was given in our January Yearbook. □



Shailesh Naik of Hewlett-Packard (left)  
and James Wright of Toshiba accepting YC's recognition for NewWave and the T3100SX, respectively.





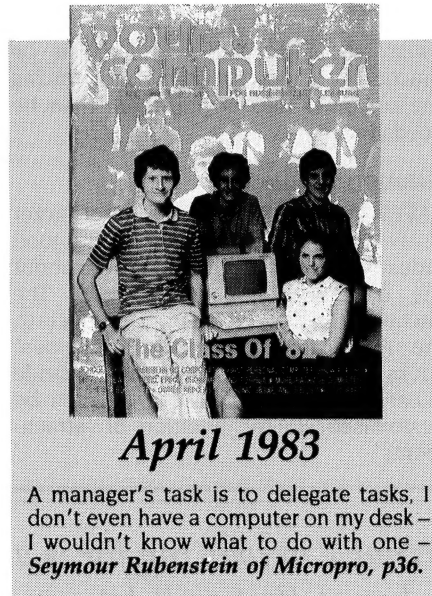
JAKE  
KENNEDY

# Happenings...

**T**HIS MONTH – just inside the back cover – we have started publishing letters to the editor again. Called 'Write Bytes', we intend those pages to be used as a reader's forum. If you have a PC problem, hardware or software, that no-one has been able (or inclined) to help you with, drop us a line – we can't promise to solve all of them, but we can try! Or, maybe you've got a gripe or an opinion you'd like to air – tell us about it. To enable us to publish as many letters as possible, keep your thoughts concise (under 200 words); for legal reasons, we may have to edit your thoughts, so be sure of your facts. Of course, we can't publish anonymous letters, but will be happy to withhold your name from publication, if requested. Since many of the letters will have to be passed on to others for comment or reply, it may take up to a month before you have your answer – so be patient: all letters will receive a reply.

Speaking of anonymous – next month (if our legal people give the nod) we have a new columnist, with a set of opinions all his (or her?) own. The first column will take a shot at computer industry commentators – watch for it and tell us what you think.

Starting this month you will find a summary of computer industry news – see pages 14, 15 and 16. While the items are



drawn from all over the world, they have been chosen with our local readers in mind. We hope you will find these pages interesting reading as well as thoughtful background and comment on developments in the industry.

A problem we constantly have here at YC is finding illustrations to break up all those words. The words are certainly what we are all about, but color pictures, dia-

grams, illustrations and cartoons undoubtedly give added depth and meaning to those words. For some time now we have been searching for a cartoonist to fill a void: someone who could take each month's theme and illustrate it with a series of cartoons. We think we've found our man – check out Paul Dorin's work in these pages, we certainly got chuckles and belly laughs from them. We're all waiting to see what he can do for next month's feature: how much humor is there in add-ons?

As I mentioned above, you can see your words to us in print now. But, in addition to letters, don't forget that we are always watching for interesting user stories, especially if the application is innovative or teaches a lesson we can all learn from. If you know of such a tale, and would like to put words to disk, the stories should be 1200 to 1500 words long; the subject material can be as diverse as your computer interests. Preference will be given to submissions on disk (we can read most formats) accompanied by hard copy. Illustrations must be captioned and we may wish to arrange photography to go with the story. If you have any questions, give Mark Cheeseman, our Features Editor, a call on (02) 693 4143. Yes – we do pay standard magazine rates for contributions from readers. □

## Future Features

IN ADDITION to our application stories and other informative pieces, each month we present features designed to keep you informed about the world of personal computing –

### June 1990

**Unix and PCs:** The rapidly increasing power of hardware has made a PC-based system a real alternative to minicomputers for sites with a number of on-line users – and 21-year-old Unix has come of age, offering an alternative to other multiuser operating systems.

### July 1990

**Desktop Presentation:** Desktop publishing, computer-based videos, presentation graphics, scanners ... the tools now

available to all businesses enable them to make effective, low-cost presentations with a professional cast.

### August 1990

**Monitors:** Whether you want to upgrade your PC or Mac monitor to color, add a VGA card or find a monitor to use with your portable or new system, our survey will bring your choice into focus.

### September 1990

**Entry-level PCs and Networking:** As the price of power drops, the low-price machines have become more powerful and now offer more than ever to small business users. Our survey and guide to PC purchasing will show you how to match a system to your needs. Also in this issue is a special feature on understanding, choosing and implementing a PC network.

### October 1990

**Communications:** Our indepth coverage of electronic communications will tell of the latest developments in 'connectivity' and present an overview of the hardware and software that's bringing it all together – from the latest in modems and fax cards to the vast range of online services.

### November 1990

**Graphics:** With the power now available to most users, graphics are being used more extensively and imaginatively than ever before. With emphasis on small business applications, we'll describe the exciting changes now taking place in computer graphics. For the real graphic power user, there will be a special feature on transputers and RISC-based machines.





HOWARD  
KARTEN

## Computer flexibility

I DECIDED TO UPGRADE my system. Ms Computer Writer's taunts about obsolescence had started to get to me. The man at the computer add-in board store tried to be helpful, but he seemed to be overwhelmed by the range of choices available to him. His spiel sounded almost like a litany: 'Do you want memory on the board? I see, and what kind of memory? On-board clock? VGA interface? What kind of ports do you want – serial, parallel, games? And, what color would you like?'

I quickly retreated to the Word Factory to re-consider my situation. On my last foray into the alleged real world, the main questions I had to answer were 'how many banks of memory would you like?' and 'can you qualify for a loan roughly large enough to buy out a small Fortune 500 firm?' Obviously, things had advanced apace since then, and now, the chief problem seemed to be the large number of choices to be made.

Perhaps, I thought, there were some parallels to this situation in the non-computer world, and if so, perhaps they would offer some guidance. Several came to mind. The most obvious was the first (and only) custom-tailored suit I had bought. The idea was appealing – a one-of-a-kind item, something that would be built to my specification alone, with no compromises. Then the reality set in – what kind of material, in what weight, what blend, with or without a vest, what kind of lining? The array of choices to be made had been so daunting I almost gave up before getting started. That suit kept drawing compliments long after a lesser suit would have gone the way of all goods. It *was* a nice suit, but ultimately, it was good basically for only one thing – to wear when I wanted to impress someone in some way.

Well, perhaps hardware would offer a more instructive parallel. One that came to mind was that quintessential pocket tool – the Swiss army knife. Switzerland has stores which will create a custom Swiss army knife for you. A catalog or display shows the different kinds of tools and blades available – you choose what you want, and the store in effect creates a tool to your order. Very characteristically

Swiss: straightforward, an emphasis on practicality – not packaging, not forcing the customer into buying more than he needs or wants.

### Kitchen utilities

LATER, AS I was preparing a bit of tucker in the kitchen, it struck me that the food industry figured out a long time ago about the basic-device-plus-attachments. The kitchen offered two very strong parallels to the PC-and-boards situation. 'Serious' cooks can buy several items which provide a basic function, which can be then be customised via the addition of 'attachments'.

---

*What I'm waiting for is a board that will let my computer whip up a chocolate souffle which I can then eat with only my Swiss army knife.*

---

One such item is the electric range. Although the 'ordinary' electric range comes with four heating elements, you can also buy a basic 'unit' – think of it as the motherboard – which allows you to plug in a rotisserie, a deep-fat fryer, and several other attachments.

Another very flexible kitchen tool is essentially a motor whose business end can accommodate alternative attachments. You can buy a blender jar for it, a dough hook thingy, a device for stuffing sausage casings, a coffee grinder attachment, and about a dozen other bits of exotica. This strikes me as the culinary parallel to data processing: depending on what your need is (wordprocessing, spreadsheet, communication – er, shrimp on the barbie, shrimp mush, or shrimp saute), you can process your grub in various ways, according to your individual need.

This, I think, is a good model for the

flexibility and functionality that add-in boards bring to the computer. The PC is a kind of platform which can be sculpted into almost anything you want. Its range of functions is simply amazing, and often under-appreciated by those of us whose primary orientation is toward more conventional crunching of data. Some boards are intended to interface to the real world, for example, and control functions or machinery, gather data from analog instruments, or serve as answering machines. Others can gather pictures and images (and then manipulate them, for example, moving people or buildings around in a picture, altering color values, creating composite pictures, digitally airbrushing pictures, and so on). More familiar products let you send or receive faxes from the PC, link it to other PCs, emulate other machines or compose and play music.

Another interesting parallel between computers and custom-tailored clothing: Saville Row suits are one of the universal symbols of wealth, privilege, and attainment. Special or unique skills, such as highly developed manual dexterity used in surgery, fine artwork, or musical performance, are a similar symbol. By contrast, add-in products for the computer are once again a democratising force – you needn't have studied for years at the feet of a master to learn these skills. If you want to try your hand with some photographic creativity, you don't necessarily need a fine hand and years of experience in using an artist's knife or airbrush or other tools of the trade. The main thing is to have read the manual or to have learned how to use these products by trial and error. Add-in boards mean that even a handicapped individual – say, someone with paralysis or palsy – can compete on an equal footing with an individual with years of skill. And, there's no risk of botching expensive materials because of inexperience. Simply make a backup copy, and play with the backup to your heart's content.

These aspects of add-in boards naturally led my mind to wander (not a difficult feat, unfortunately) to other aspects of the real world. It was then that I realised, to my horror, the down side of add-in boards: the very flexibility of boards offers



an option to clever manufacturers that does not augur well for us consumers. Consider this – as a manufacturer, you could use boards to create hitherto unavailable (and unneeded) functions in otherwise perfectly mundane products. The customisation property of boards means you could take some elementary product, re-design it to include a slot for a plug-in board, and behold, you now have, not merely a simple product available in eight pastel colors, but a whole 'product line', limited only by the imagination of a programmer! And, following the inevitable practise of manufacturers, the manufacturers' added cost for the add-in board and re-design, would be multiplied several-fold by the time the item got into the hands of consumers.

### Computer toilets

LEST YOU THINK these are merely idle fears, here is a perfect example. An article in a major American business magazine about a Japanese firm making computer-controlled toilets bore out my worst fears. (A gentleman in Parramatta has just thrown the magazine down in disgust at

*The PC is a kind of platform which can be sculpted into almost anything you want.*

Americans' alleged preoccupation with toilet matters. I assure you Mr Bromley, it's true! And, in any case, it's not *Americans'* obsession with matters of plumbing, but the Japanese; I don't make the news, I just report it. If you still don't believe me, check out *Forbes Magazine*, February 5, 1990.)

The toilet comes in a 'plain vanilla' version familiar to us all, as well as a de luxe model containing a plug-in board that controls various functions and does all sorts of computations. (If you're puzzled by how any computer can improve on Mr Crapper's invention, well, so am I. Nor do I grasp just what kind of data one might collect. What's it going to do – compare flushes-this-quarter with flushes-last-

quarter? And, so what if you're up this year, are you going to stop flushing?

Thus far, the Japanese seem not to have grasped some of the elementary ways they can use this device to perform surgery on consumers' wallets. They could offer the add-in board which gives you a whole 'toilet experience' – providing the atmosphere, say, of a toilet in Buckingham palace, or the Taj Mahal. I can just imagine some of the advertising: 'Experience the splendor that Indian Maharajahs had in their toilets!'

Of course, I know none of *us* would ever fall for such a gimmick, but we all know there are some 'early adapters' out there who fall for – oops, I mean, rush eagerly to embrace – any new technogimmick. The fashion pages of the daily newspaper are full of examples.

Perhaps this democratisation/customisation stuff has gone too far, after all. For my part, I think I'll stick to the plain and simple. What I'm waiting for is a board that will let my computer whip up a chocolate souffle which I can then eat with only my Swiss army knife, while wearing my bespoke suit. □

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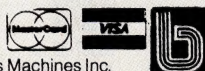
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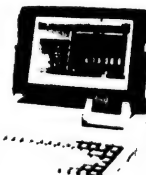
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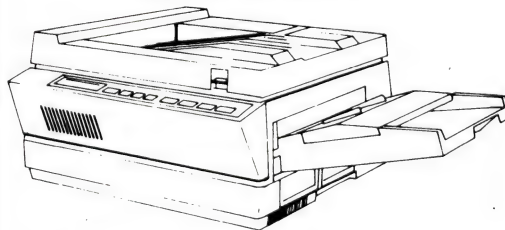
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**WILLIAM OLSON**

# Stores, forests and taxes

**C**OMPUTERS, CAR phones and fax machines are part of a new office equipment marketing approach from NSW retailer Norman Ross Discounts. Seven Norman Ross stores now have an office equipment division, controlled by Discount Technology (a separate company leasing floor space in each store).

Canberra's Norman Ross store in Woden, is in a position to pick up plenty of computer sales. The technology manager, David Smith, says that the Woden store is the only home and office computer retailer in the area. 'We have introduced a range of computers to appeal to all markets. The products have been chosen carefully to ensure the best for each market segment.'

Commodore Amiga computers are proving to be top sellers at the store – they are finding use in homes, schools and small businesses. Also, Smith says that Olivetti PCs have been so successful with business buyers that they have been scrambling for extra stock. 'A lot of retailers think the market stops dead in the first part of the year – we know it doesn't and our sales figures prove it.' Laptops from Epson and printers from Okidata complete the computer range. Fax machines from Sony and ABE are also available.

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*The computer business suffered headaches from sales tax on software until last year when that tax was lifted.*

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Smith says he's impressed with Olivetti's approach to business. 'Their staff training courses, service and backup have been tremendous.'

Each Norman Ross store has \$250,000 worth of computer and office equipment stock for sale. 'We are on a fast learning

curve with computers, but we aim to have a large slice of the market within twelve months.'

Security is always a problem with computers and Canberra has had a sudden surge of thefts from homes and businesses in recent months. He says they lost a top of the range Epson laptop to a gang of shoplifters who came into the store just before closing one Friday night. To date, nearly \$200,000 worth of PCs and periph-

erals have been taken. After a recent police raid, more than 30 PCs were recovered from a Canberra home. Federal police have made the point that with the video recorder market now close to saturation, personal computers are worth more on the black market and are just as portable.

### **Sneaky sales tax**

COMPUTER HARDWARE attracts a 20 per cent sales tax in this country, as do related



*A lot of retailers think the market stops dead in the first part of the year – we know it doesn't and our sales figures prove it – technology manager for Canberra's Norman Ross store.*



peripherals. With some organisations, there is always the temptation to boost profits by understating stock values for sales tax. The small sales tax is actually misleading because the tax is not levied against the price you and I pay over the counter. Sales tax is applied on the whole-sale price of the item, so it should really be called a wholesale tax.

Recently, sales tax avoidance schemes have been getting more attention from the tax office. The computer business suffered headaches from sales tax on software until last year when that tax was lifted.

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*A director of another Sydney company has been ordered by the courts to repay \$250,000 in sales tax avoidance from his own assets.*

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The sales tax prosecution manager at the tax office, Michael Stone, says the tax office expects to boost sales tax payments by millions of dollars through a series of prosecutions this year. PEST (or Prosecution for Equity in Sales Tax as it is known) has already recovered the cost of training sales tax investigators since it began last year. Stone said that the tax office was interested in repeated or serious breaches of the sales tax laws. One well-known company was caught evading \$2 million in sales tax, while a director of another Sydney company has been ordered by the courts to repay \$250,000 in sales tax avoidance from his own assets.

Computer hardware sellers and suppliers are reported to be keeping a close watch on PEST and its prosecutions. The tax office knows that prosecutions of only 10 per cent in any industry for tax avoidance leads to nearly a 90 per cent increase in tax compliance and payment.

### Computer forests

FOREST DESTRUCTION in the south-east of NSW is still a hot issue. Senator Peter Cook, the federal minister for resources, recently announced financial support for a forest computer modeling project.

The computer model would simulate growth and yield rates on logging, and would help the advisory committee for the

NSW and federal governments to reach decisions about logging licenses.

Although the computer study will only look at the nine per cent of south-east forests available for logging, some conservation groups are critical of any decisions made because they believe five of the six members of the committee are associated with logging interests.

Harris Daishowa, the logging company at the centre of the debate, wants a 17 year contract to export 850,000 tones of woodchip each year. The computer model will help the committee decide how realistic this 17 year logging demand is.

Computing is one of the Canberra's biggest industries with over 500 companies listed in the phone book. A recent announcement from Canberra's local government that it would review local payroll tax arrangements was welcomed by Bob Mounic, executive director of the Information Industry Association.

Until recently, contracting agencies were being treated as employers for payroll tax collection. The tax was on the agency (and not on its client) so the cost was difficult to pass on.

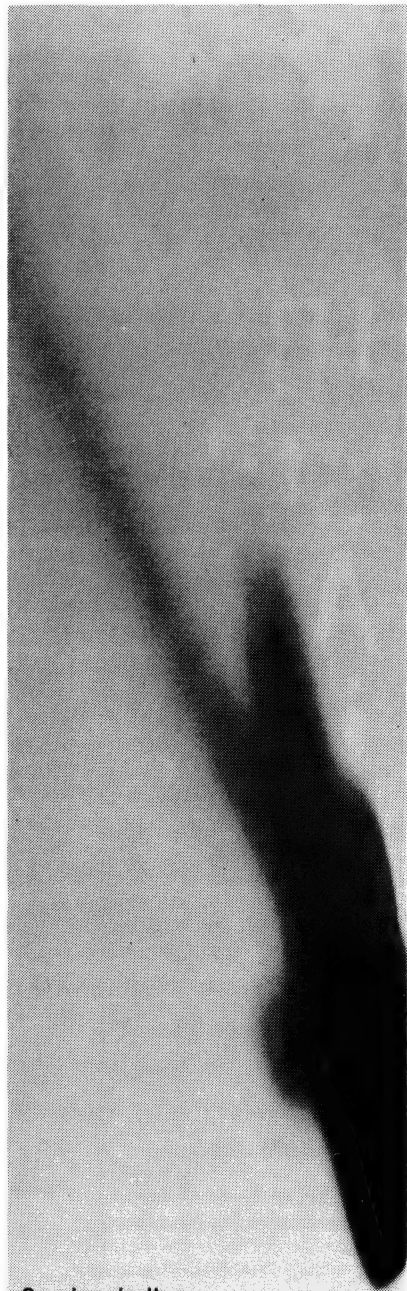
Also on costs, the AIIA is complaining about the \$5000 fee the Civil Aviation Authority is charging for tender documents. Mounic says the fee put 'an unnecessary hurdle in the way of business dealings with the government'.

Because the fee was mostly non-refundable, it had the potential to seriously disadvantage specialised small companies needing access to tender information. The fee was unreasonable commented Mounic, who also criticised the Civil Aviation's decision to only hold briefing sessions in Canberra, as this was out of step with the government's usual policy.

The AIIA is also helping Austrade with a series of seminars on how to market Australian software in the US. The seminars include expert speakers on finance and marketing. Meanwhile, Austrade is preparing for another Japanese mission to sell Australian software following its successful visit last year. Last year's mission concentrated on Unix software applications. The four Australian companies which took part, Laboratory Associates, Mocom Corp, RJM Systems and Ceanet, have all since reported increased business and inquiries from that trip.

The new mission in June will concentrate on CAD/CAM software applications. The software and services industry federation of Australia (now amalgamated with the AIIA) is a sponsor of the mission together with Austrade. □

## Without a shadow of a doubt



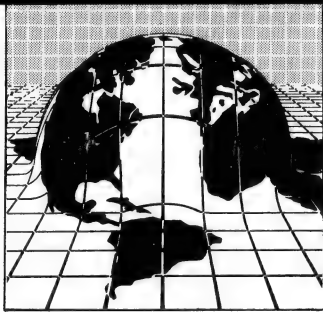
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# INDUSTRY UPDATES . . .



## IBM still AIX-ing!

IN SIMULTANEOUS press conferences around the world, IBM announced another attempt to crack the market for scientific workstations with the System 6000, a RISC-based system under IBM's AIX operating system. While about 250 units of the machine are currently in use, volume shipments won't start until May.

In the days before the announcement, IBM's stock rose sharply, offsetting the effects of Drexel Burnham Lambert's Chapter 11 filing, as stock buyers anticipated what the new machines can do. In a demonstration, the entry-level POWERstation 320 was able to calculate a complex Mandelbrot set in one minute 41 seconds, while the RT-PC it replaced took 32 minutes. The machine is rated at 27 million instructions per second (MIPS), and performs seven and a half million floating point calculations each second, with five instructions processed per cycle.

The reduced instruction set computer (RISC) architecture used in the new machines is called Performance Optimisation With Enhanced RISC, or POWER.

The top-rated machine in the line is said to handle 41 MIPS and 13 million floating point calculations per second. IBM also noted that there were plans to announce 'many improvements in the machines'.

The new machines use a new design of IBM's Micro Channel Architecture for plug-in cards, and a new release (version 3.0) of AIX, IBM's own Unix. AIX also runs on the high end of the company's PS/2 line. The workstations run on low-power complementary metal oxide semiconductors (CMOS) chips, similar to those used in laptops.

AIX version 3 includes features specifically designed for the System/6000. Advances are claimed in disk management, file handling, virtual memory control, friendliness, as well as performance. Also announced is the graphical users interface, AIX-windows Environment 6000, from OSF, an enhanced version of X-Windows. It incorporates Display PostScript from Adobe. Another new release is InfoExplorer, a text and graphics retrieval system which works in a hypertext environment, such as with CD-ROM-based data.

IBM's goal is to get a dominating position in the engineering workstation market by 1992, from a standing start. 'We're launching a new business, in a \$10 billion marketplace, where we have demonstrated negligible market share,' admitted an IBM regional vice president. He emphasised that, while software does need to be ported to AIX from other versions of Unix, the System 6000 family is based on open systems and multi-vendor compatibility.

Only time will tell whether IBM's proprietary chip set and proprietary version of Unix can succeed with this new addition to the range, despite their high speed ratings. Although most industry analysts feel the company has a winner.

### A place for Wangaratta

IBM ALSO announced that it will manufacture its System/6000 RISC workstations and servers at its Wangaratta, Victoria, plant. The factory will ship machines to Japan, China, New Zealand and other Southeast Asian countries, as well as serving the local market.

Plant Manager Jim Hallmark commented that he would be

sourcing as many component parts as possible, locally. The plant will initially use its System Packaging Centre (SPC) to custom-configure machines prior to delivery (including software installation).

IBM Australia also announced its status as one of the two IBM 'porting' sites, where vendor software is approved and/or

ported to IBM environments, including the IBM AIX machines. This is to be done at the IBM Australian Programming Centre – the other site is at Austin, Texas.

The Wangaratta plant currently produces PS/2 machines for domestic use and export to Asia, with 50 per cent of production being exported. □

## Belt tightening at Apple

APPLE CEO John Sculley recently visited Australia fulfilling a promise he made to Australian Apple sales personnel last year. While here, he addressed leaders of the Australian MIS industry, noting that the '90s will be the decade of information, where 'by the end of the century, 98 per cent of the world's data will be digitised.'

When asked if Apple was planning to release a file server or multi-user machine, he said, 'No. That isn't our area of expertise. We see ourselves as providers of workstations.' He went on to say that the company will concentrate on promoting Macintosh use in high schools as this would ensure a steady stream of Mac-oriented users moving into the workplace. 'We have to do some belt tightening, but we hope to take advantage of economies of scale. One thing we'll never do is reduce spending on research and development.'

But the pipeline for the Macintosh II has been turned off. The modular version of Apple's best-seller is no longer in production and has been removed from the company's official price list. It has been replaced in the range by the Macintosh IIfx which also has six expansion slots.

There is an upgrade path for current Macintosh II owners. Third party suppliers offer hardware add-ons, including hard disks, and Apple offers motherboard swaps, as well as the PMMU (Paged Memory Management Unit) necessary to run applications such as Apple's A/UX version of Unix. □

### Dragon Quest fix

A NEW version of the highly addictive Dragon Quest was released in Tokyo in late February and sold an amazing 1.3 million cartridges on the first day. Bic Camera in Ikebukuro, Tokyo, attracted the largest number of buyers, selling some 10,000 cartridges at a 30 per cent discount – the local retail price is 8,500 yen (\$77). More than 10,000 addicts waited through the previous rainy night, forming a line two kilometers long.

Four high school students, waiting for the Kyoto branch of a large department store chain to open, received minor injuries when they were pushed into a glass door. Competition for the fast selling stock was so fierce that some 60 cases of Dragon Quest junkies had their new fix snatched from their hands. There was even a case of blackmail reported.

Tokyo-based Enix introduced the Dragon Quest series in 1986 for use on the Nintendo Famicom (the Nintendo Entertainment System overseas). Over seven million cartridges were sold up to the time of the release of the new version. Enix expects to sell some three million copies of Dragon Quest IV by mid-year and is requesting more supplies from Nintendo, which manufactures the software. □



## Toshiba expanding laptops

TOSHIBA HAS announced a range of system expansion products for the new notebook-size portables, the T1000SE, T1000XE, T1200XE and T3100SX for the US market. In a 'statement of direction' the company assured those who have already purchased these laptops, they will be able to acquire the expansion system later in the year. Locally, Toshiba declined to comment on the availability of the units.

DeskStation 2 for the T1000SE, T1000XE and T1200XE will provide slots for two 8- or 16-bit PC/AT-compatible cards to provide connectivity to local area networks, mid-range computers, mainframes, external displays and other peripherals. Connection of the portable computer to the DeskStation 2 will be a simple snap-together using the expansion connector already built into the rear of the laptops. The unit will include its own power supply for charging the battery in the portable as well as for powering the cards.

DeskStation 3 will provide three slots for PC/AT-compatible cards for the T3100SX 386-based laptop. This system will also have its own power supply. □

## Intel takes more Risc!

CHIP-MAKER Intel has bought more stock in Multiflow Computers, a US-based superminicomputer vendor, and will introduce Multiflow's technology into its Risc (reduced instruction set computer) processor, the i860, as a result of the move.

The supermini vendor lured Intel with its VLIW (very long instruction word) technology, an architecture which combines several orders into one instruction. This architecture has already been applied to the firm's machines, called the 300 series. With the technology, up to 28 operations are conducted in one CPU clock cycle. Observers note that philosophy is quite different from that behind other parallel processing architectures.

In October last year, Intel also invested in Alliant Computer

Systems and is working on a new software standard for the i860, called PAX (parallel architecture extension). Intel expects to integrate PAX and VLIW to enhance the performance of its RISC processor. □

## OCR advances

PERSONAL computer software house Birds Systems Research Institute of Tokyo, claims to have developed a software program which scans and recognises English and numeric characters with what is claimed to be the world's high recognition rate – over 99 per cent.

With the aid of an image scanner, the recognition program reads and inputs English-type characters and numerals written on document and magazine papers. Birds is now planning to export the software, which it expects will sell well due to its high recognition rate and low price. The company expects to complete an IBM PC/AT version in May or June, and will sell it in overseas markets for around \$US1000. □

## Smart kids go online

IN CANADA, Alberta's Special Education Network (ASPEN) recently honored its 1,000th user, but the user list has already expanded to about 1,400. In September, 1989, teacher James Aitchison from Granum Junior High School in Calgary, signed on as a new member to the 24-hour computer network that assists in meeting the educational needs of exceptional children. Early this year, Alberta's Minister of Education, Jim Dinning, presented Aitchison with a Supra-Modem 2400, and a framed ASPEN poster.

The ASPEN service has been open to teachers, parents and anyone else with an interest in educating exceptional children since June, 1988. □

## Notebooks support laptops

INCREASING sales of notebook-sized computers have swollen figures for laptop sales in Japan's

## Color LCDs on the way

SINCE THE exhibition of prototype color LCDs (liquid crystal displays) at the Business Show held in Tokyo early last year, electronics makers have been rushing to increase the size and output of the new displays. Following leading LCD makers Sharp and Hitachi, NEC has initiated a process for mass production of 10-inch color LCD panels.

According to the announcement in Tokyo from NEC, it will invest 10 billion yen (\$90 million) in its semiconductor chip-making subsidiary on Kyushu in order to create a production line for active matrix drive color LCDs. The line is expected to produce 20,000 panels each month of 10-inch-sized displays starting in August. That figure is also NEC's estimate of its share of the market. □

domestic PC market. According to a report by the Japan Electronic Industry Development Association, 197,000 laptops were sold in the financial year ending in March, 1988 – this represented 14 per cent of the whole PC market. In the first half of the 1989 financial year, however, laptop sales recorded a 90 per cent increase over the past period, and

now have over 20 per cent of the total market.

This year, the increase is expected to be even more dramatic. Sales of notebooks computers from Toshiba, NEC, and Epson are expected to reach 400,000 units in 1990. Industry analysts are predicting that laptops will hold 50 per cent of the market within several years. □

# Lotus vs. Paperback

LOTUS Development's suit against Paperback Software International of Berkeley, California, and Mosaic Software of Cambridge, Maryland, alleging copyright infringement in spreadsheet program development, has finally gone to court.

Lotus representatives arrived in court armed with computers to enable them to illustrate why they think products introduced by the two competitors named in the suit, too closely imitate the Lotus 1-2-3 spreadsheet business program.

Unlike most patent infringement suits filed in the past, the Lotus suit does not focus on the inner codes of the software, but concentrates on the user interface including both keyboard commands and on screen images. While experts agree that the internal code in a program falls under the protection of the copyright laws, there is some question as to whether those laws cover user interface elements. Lotus contends that because the user interface elements are the expression of an idea, they are indeed covered by the copyright laws.

The video testimony was presented in court on multiple screens so that the judge, the participants, and others in the court room could watch as the computer programs were demonstrated. Charles Sullivan, a Lotus product marketing manager, demonstrated the use of a spreadsheet (Lotus 1-2-3 was used as an example) from basic organisation of figures through to some of the program's more complex functions. He then performed the same facilities on two other screens using programs from Paperback Software and Mosaic Software.

According to Associated Press' business writer, Jonathan Yenkin, the only visible difference between the Lotus display and the other two was that the Lotus menu bar ran across the top of the screen



while the other programs positioned the same bar at the bottom. Once the similarities were established, Sullivan demonstrated a spreadsheet program from Microsoft that required totally different menus and commands to create a similar spreadsheet.

Paul Gupta, representing Paperback Software, headed by Adam Osborne of Osborne-1 fame, commented that the courtroom demonstration had been 'instructions for a machine, not expressions of an idea.' Lotus contends that the system of commands and screen images are a product of careful thought and even presented affidavits to that effect including one from Mitch Kapor, Lotus founder and co-author of Lotus 1-2-3, who outlined how he helped develop the program and decided on each element.

Gupta also contended that in order to make a product truly compatible with Lotus 1-2-3, the company had to use technologies that result in similar images and commands. He said that where Paperback Software had the opportunity to make changes, they made them. Gupta, while saying that what appears on a menu does not constitute expression, added that he couldn't see how a list of words on a screen (the menu bar) could be 'copyrightable.' □

## Education computers fail

THE VICTORIAN Curriculum Assessment Board (VCAB) had to post new results to students after a computer keying error was discovered in high school leaving exam results – for the third time in two weeks. Over 100 students who sat for the Victorian Certificate of Education Maths A, B, and Physics, had their marks decreased by eight per cent. In the previous two weeks in two separate incidents, almost 5000 students (of some 40,000) had mistakes printed in their math and English results.

With the marks adjusted to make up for the latest mistake, 24 students went up one level, three have now passed subjects they had been told they'd failed, and eight have had B grades changed to A. A VCAB spokeswoman said computing and senior staff were working 'around the clock' to correct the mistakes and to ensure that no more had occurred. □

## SKATE-ing for street kids

A NUMBER of street kids will get their first taste of computers this year through an innovative program called SKATE, operating from the Kuringai campus of the University of Technology, Sydney.

The program is an attempt to give needy young people a bridge between their final school level and the standard required for higher education. One of the subjects to be studied is computers where a basic understanding of wordprocessing, spreadsheets and MS-Dos systems will be taught. It's hoped the computer content would be enlarged this year to include computer graphics.

A student counselor for SKATE reports that one of the main problems is that most of the young people at whom the course is aimed don't have a per-

manent base. 'It is very hard to attend college each day when you don't know where you'll be sleeping each night,' he said. □

## Waiting for Windows 3.0?

ALDUS WAS unwilling to discuss the PC version of PageMaker 4.0 at the release of the Mac version – and blamed Bill Gates and Microsoft.

After the press conference and pointed prompting by journalists, Aldus screened a short video produced by Microsoft. It showed an open window (from version 2.0 of the product, in fact) through which the camera zoomed to a looming closed window on the horizon. All that could be seen through the second window was Bill Gates, Microsoft head, wagging his finger which was generally interpreted to mean: 'we'll tell you when you're ready for Windows 3.0, so

don't bother knocking!'

Aldus has promised second quarter shipping – 'by June 30' was the only specific date mentioned – for the Mac version, although the press handouts told of plans for April. 'We had planned on a PC launch first,' commented Aldus Marketing Manager Roger Gulrajani, at the Sydney announcement. The implication from both Aldus and Microsoft was that until Microsoft ships Windows 3, no products that require it will be announced. The unanswered question is whether or not some pressure on Microsoft from IBM may be affecting the date? □

## Graphic PageMaker

USERS WHO have seen version 4.0 for the Mac were impressed by new features such as indexing, greater typographic control and full-featured wordprocessing – and by the way, many new features have been implemented. Aldus has left the door open for third-party developers to add features – some suggested products could offer PostScript previews, more graphic and automatic creation of indexes.

Aldus hasn't lost sight of version 3's strong points – files created with the old version are still usable, and the company is intending to have the PC products file and function compatible with the Mac version. New file status will be incorporated for easier use by workgroups – all users will be able to easily determine the status of files and opening a 'publication' with one of the source files changed, will

cause a prompt for action, such as using the new file. □

## Terran to the defense

MELBOURNE-based Terran Computers picked up a contract worth more than \$20 million over the next four years, because of the current shortage of local PC manufacturers – IBM is having trouble meeting its Australian Defense Department contracts.

Unusually, the contract was awarded under a clause in IBM's contract with the Defense Department which enables new technology or machines to be introduced if there was a need for it. The contract doesn't specify the number of machines or their cost. Terran has agreed to deliver up to 1200 machines a year. □

## Academics joined in network

IN MAY, a new network to join Australian academics with their overseas colleagues is to be installed in May. The Australian Academic and Research Network (AARNET) will link local area networks from Australian universities, colleges and institutions in a high speed communications network. AARNET is intended as a forum for the exchange of ideas and data with academics involved in similar systems throughout the world. Total cost for the first year is estimated at \$2.5 million. □

## EDI on the move

THE USE OF Electronic Data Interchange (EDI) will jump dramatically in the next few years. Coopers and Lybrand noted recently. (EDI is the electronic exchange of information such as shipping notices, invoices and purchase orders, between companies – it allows complex transactions to be handled more quickly and accurately while reducing the volume of paperwork).

Of Australia's top 1000 corporations, 240 were surveyed (144 had annual revenues over \$50 million dollars). Of the respondents, 120 had already implemented some form of EDI, or planned to implement it in the next two years; of these, 79 were planning to deliver purchase orders using EDI by 1992 and 55 expected to be delivering invoices using EDI at the same time. Currently, only 19 of those surveyed were doing so. Those without plans either had not investigated the system or were waiting for more general acceptance. □



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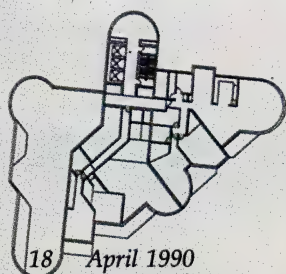
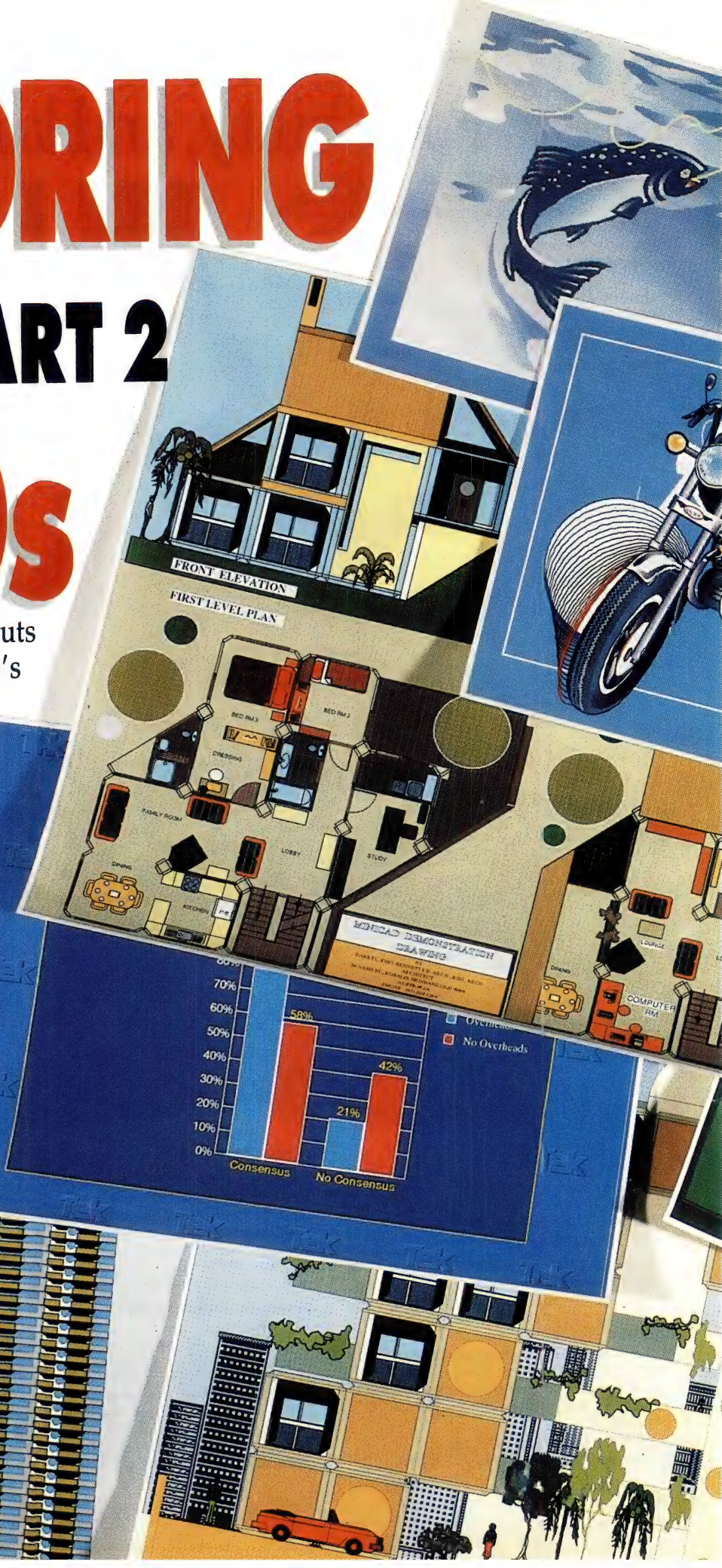
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# COLORING THE PART 2 1990s

There's no doubt color printouts have more impact – but there's a price to be paid and a confusing choice of technologies. Pierre Cochrane paints the picture.

**C**OLOR IS A natural part of our world. In Western societies we have many cultural assumptions about color, for example most maps are drawn with blue seas and brown or green land; brides wear white because white emotes clean, pure and virginal; red means





## Visual communication is powerful

- People understand and retain more
- People find it easier to make decisions



stop, danger, hot, agitation; blue is associated with water, cold, rest, calm; yellow is caution, slow and cheerfulness. Using these colors helps hold an audience's attention, makes complex information easier to express as well as understand and adds value to the information being presented. Whether you are creating a work of art or a presentation, color helps you get your message across.

Color scientists calculate that you can probably discriminate over seven million different colors if you have normal color vision. You can also detect about 150 steps, changes in brightness and saturation within the visible spectrum from 360 to 760 nm (violet to red).

So why do high-end PCs and sophisticated color printers bother generating a palette of 16.7 million shades? Are these excess colors wasted? Not at all! This enormous number of colors allows the

smooth shading of one color into another which in turn fosters the life-like realism possible with high-end displays and printers. In addition it takes a certain degree of over-kill in color palettes to accommodate what's known as the nonlinearity of the human visual system: with some colors we can detect very small changes in hue, while in others much larger changes are unnoticeable.

### Current technologies

AT LEAST SIX different technologies are currently used to get your glorious color screen images into print. Each has its own advantages and disadvantages, but three different color technologies vie for the popularity honors: impact, inkjet and thermal wax transfer.

Color dot matrix printers are the lowest priced color output systems. These impact printers use the same printing method as a standard text printer: a set of magnets drives a number of small pins against a ribbon, which causes ink to be transferred to the paper.

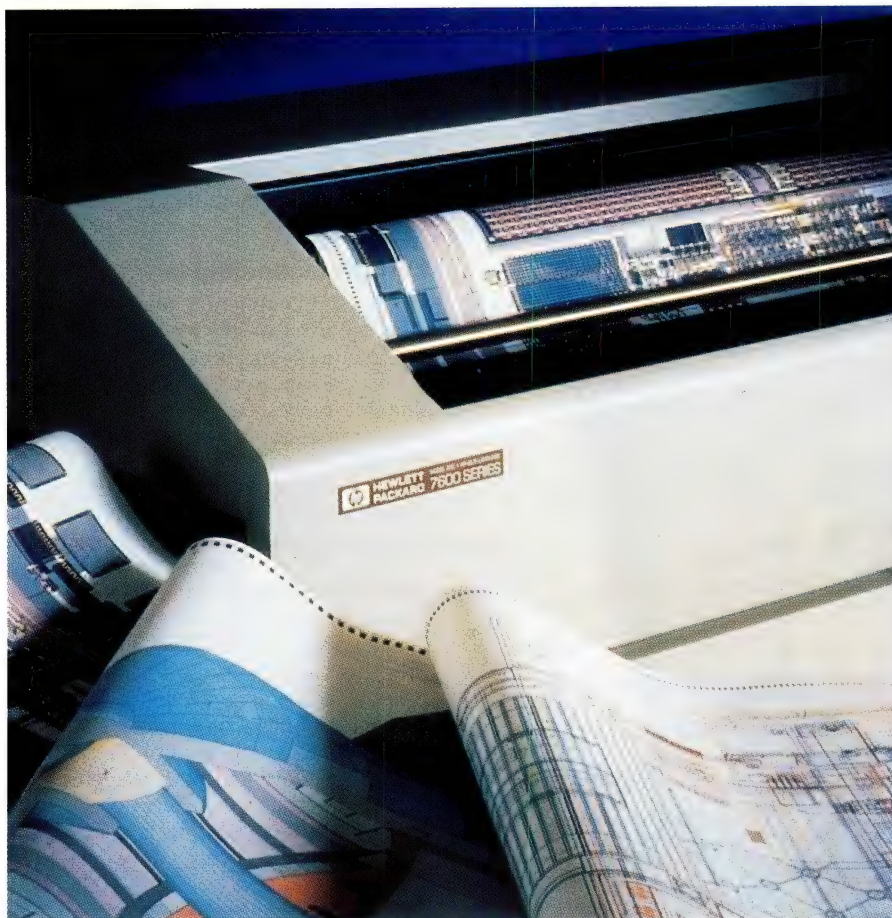
In this case, the ribbon has four bands of color: cyan, magenta, yellow and black, producing either 4 or 7 colors, depending on whether or not the printer can over-strike. Their color output is the least satisfactory of the color technologies described. Distinct banding is evident, and the colors are not very intense. They are also the noisiest of color printers.

Color printers use 24 pins and are typically rated at 360 dpi (with a 0.01-inch dot size). There seems to be little likelihood of reducing their dot size. Print needles much thinner than that become very fragile, and tend to pierce both the ribbon and the paper – which is hardly the desired effect.

These printers are as fast as 24-pin monochrome printers when it comes to printing text and are thus an excellent choice in those cases where color graphics is not the main application. They can print on all types of printer paper but are not suitable for use on transparencies for overhead projection. Graphics speed is between the inkjets and the thermal wax printers. They are ideally suited if your main application is for fast draft or NLQ black text, with an occasional color graph. Color output from dot matrix machines varies much more than those using other technologies, and the prices vary more, too. If you decide your needs can be met by a dot matrix color printer, it is well worth shopping around – don't forget to find out how much replacement ribbons are before deciding since their cost can vary by as much as a factor of ten!



## COLOR PRINTING



*The HP 7600 series model 355 is Hewlett-Packard's latest in color electrostatic plotters. With a resolution of 406 dots per inch in up to 2048 colors, it's priced at \$84,300. Monochrome versions can be obtained from \$44,000, and all machines come with a 12 month on-site warranty.*

### Inkjet printers

INKJET PRINTERS have become very popular and are next on the price scale. They produce color output by shooting tiny droplets of ink at the paper. Each color has one or more nozzles and printing speed is to some extent dependent on the number of nozzles, since more nozzles can deposit more ink on each sweep across the paper. However, this is not a hard rule and some of the fastest inkjets use only one nozzle per color.

Inkjet printers' resolution goes up to 240 dpi and is likely to reach 300 dpi in the near future. At the moment, the highest resolution color inkjet is Tektronix' Color-Quick, at 216 dpi. Printers such as the Xerox 4020 and the Tektronix 4696 provide 240 x 120 dpi.

The current crop of inkjets is very resist-

ant to clogging, a problem which used to plague earlier models and gave the technology a bad name. However, clogging is what will ultimately limit the available resolution. The smaller jets needed to produce ever smaller ink droplets will suffer more from dried ink or tiny dirt particles.

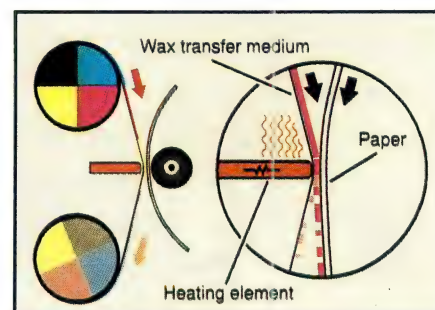
The speed of inkjets is also improving. High quality printers can produce an A4 page in under 2 minutes, and A3 in about 4 minutes. Some printers have a high-speed text mode – for example, the HP PaintJet can print text up to 167 characters per second, but it is much slower on graphics, of course.

For best quality output, inkjets require special paper. Bond paper may be useful for previews but the water-based ink tends to smudge on it and colors are not as vi-

brant. Media for transparencies also need to be specially coated to absorb the liquid inks.

Special paper, special inks and in some cases, special print heads, add to the running costs of inkjets. Typically, this is between 25 and 40 cents per page for consumables – compare that to the three to five cents per page for a dot matrix color page (of course, there's no comparison for quality).

The Pixelmaster from Howtek is an inkjet with a difference. Instead of ink it uses colored plastic, which is normally solid but heated to melting point and then squirted at the paper. It works at 240 dpi and prints a page in about 3 minutes. The ink is very durable, scratch resistant, and has an embossed look and feel. It prints on plain paper but unfortunately the process is not suitable for transparencies as the plastic ink is opaque. Weighing about 30 kg and standing almost a metre tall, it is not a printer for the faint at heart.



*In thermal wax transfer printing, colored wax is heated and fused to specially coated paper. A thermal transfer roll is segmented into page-sized bands of wax pigments. Up to several thousand individually controlled heating elements, melt pinpoints of color onto the paper, which makes three or four passes under the head. The setup shown here is that used in the Tektronix 4693 range.*

### Thermal wax

AT PRESENT THE best color output is provided by the thermal wax transfer method. A plastic ribbon coated with colored wax is sandwiched between the paper and a row of heating elements. The wax melts and sticks to the paper. Three or four passes with differently colored wax ribbons produce the 7 basic colors; dithering produces a large number of shades.

Unfortunately, I do not expect the reso-



## A ColorQuick for Mater

THE MEDICAL photography Department of the Mater Public Hospital, South Brisbane, has recently purchased a ColorQuick A3 printer from Tektronix. Linked to a Macintosh IIx. The ColorQuick inkjet printer is used to produce a range of medical teaching materials and posters for the Hospital's full time medical and consulting staff, on subject matter for every conceivable medical speciality.

Introducing the Macintosh and ColorQuick printer into the Photography Department raised a few questions at first because the staff were photographers, not computer graphic artists. Department head Mr Elwood explains: 'There was just no time available for training on our new equipment. The Byte Centre from Brisbane came in one day and plugged in the ColorQuick printer and turned it on. I read the manual and dived straight in.

'There were no problems, no hitches. In fact my first impressions were how incredibly quiet the Tektronix printer was in operation and how fantastically fast it was.' The ColorQuick printer is continually in demand. Doctors and allied health professionals at the Mater Hospital are constantly requesting the Department to produce audio-visual aids and support materials for presentation at specialist medical conferences.

There are a great many medical conferences every year. Conference organisers seldom have session time available for all prospective speakers in the program. Instead the overflow are invited to submit posters summarising their presentation for display in a gallery located near the main auditorium. At some conferences there might be 50 to 60 posters on display and these posters have become

an important part of the conference in their own right.

It is the job of the Photographic Department to produce them on behalf of the Mater Hospital's medical staff. 'Before installing the computer equipment and the Tektronix printer we used to photograph typewritten copy and photographically enlarge it to fit the column width. However carefully we determined the typewritten column width, the length of the enlarged block of text rarely exactly fitted the space allocated for it. This meant retyping the text to a different column width and repeating the entire photographic procedures', Elwood said.

'With our new equipment we are not only able to dramatically reduce production time for body text but can vary point size and use bold text or italics for further emphasis. The addition of colour to text and graphics using the inkjet adds a further dimension to the visual impact of the finished products.'

A great deal of effort is put into researching and collating data for conference presentation by medical and allied staff. The task of the Medical Photographic Department is to present the data so that it is easily comprehended and has the visual attraction of international standard colour computer graphics. Poster production continues around the clock with one deadline following hot on the heels of another. The Department's latest posters have been produced for the Intensive Care, Pathology and Pharmacy Departments.

'Usually a doctor will ring and let me know a conference is imminent and the deadline for the poster and support materials needed', said Mr Elwood. The doc-

tor and designer sit together and talk through the poster design and content.

'I layout the material I have been given on the floor to see how body text and illustrations will best fit together. Next I work out whether to use vertical or horizontal columns and the point size needed to fit the poster dimensions. We may well use 100 point or larger for the main headings with body text from 18 to 36 point.'

As the design of the poster becomes set, the designer discusses colours and legend conventions that need to be followed with the author. When the various text and graphic panels are printed out on A3 paper they are mounted as a montage on heavy cardboard. Photographic colour illustrations or colour photocopies which have been scaled to size, are also used where appropriate. The complete poster is then cut into convenient sized panels for transportation.

'Using the ColorQuick printer I can quickly reprint text and graphic panels until the correct size and proportion is obtained. I can enlarge or shrink blocks of text, re-size digitized images, and charts and graphs until I am satisfied that the textual and graphic elements of the poster fit together as planned.

'As well as having visual cohesion it is important that the eye is drawn through the poster in the correct sequence', Elwood noted.

After three months of operation, everybody in the Photography Department is convinced of the technological superiority of the ColorQuick printer. Not only is it quiet in operation but its presentation is vastly superior to other printers the Department has used.

lution of thermal wax printers to improve much. As the print elements get smaller, it becomes increasingly difficult to stick tiny wax pixels down in the valleys between wax layers deposited on earlier passes. The problem already exists on 300 dpi printers, but at that resolution it is rarely noticeable.

These printers tend to be fairly expensive (more than \$10,000), but usually include a fair amount of built-in intelligence. The Tektronix 493DX, for example, uses a 68020 processor with up to 12Mb of memory on board to perform its image processing and dithering in hardware, freeing the computer for other tasks. Apart from dithering, it will also scale and rotate the image to fill the paper, perform color

*There is a good chance  
that color lasers have  
missed their  
opportunity.*

corrections to improve the image quality, and a host of other functions. It can also use its memory to queue multiple images.

Thermal wax printers perform reasonably well on bond paper, but its roughness may not let the wax adhere everywhere. For optimum quality they special, very smooth paper is required. Special transparency material is also required.

These printers tend to be very reliable and reasonably quiet. They are cleaner on the hands than either inkjet or dot matrix printers as the wax ribbon is perfectly dry. The wax has a glossy surface which many people prefer to the flat colors produced by inkjets.

The cost of running a thermal wax printer is fairly high, at about a dollar per page. On the other hand, the best wax printers, at 300 dpi resolution and with 16 million colors, produce output that is unmatched by any other current technology. Until color laser printers, or thermal dye transfer printers become available, they will reign supreme.

If large prints are required, an electrostatic printer/plotter is the way to go. In



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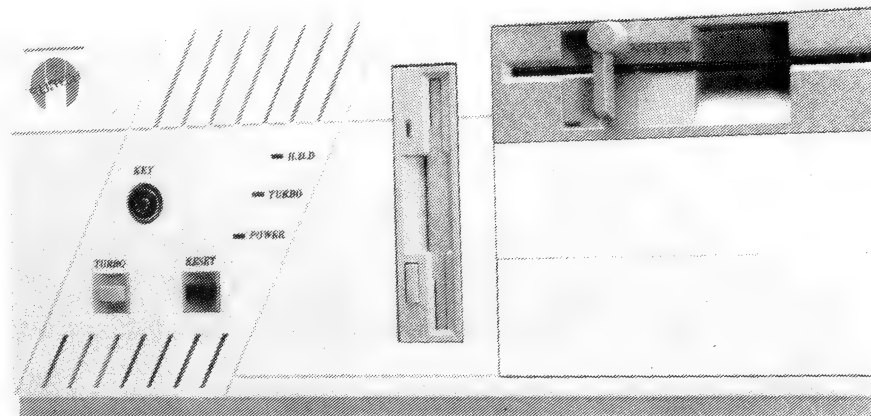
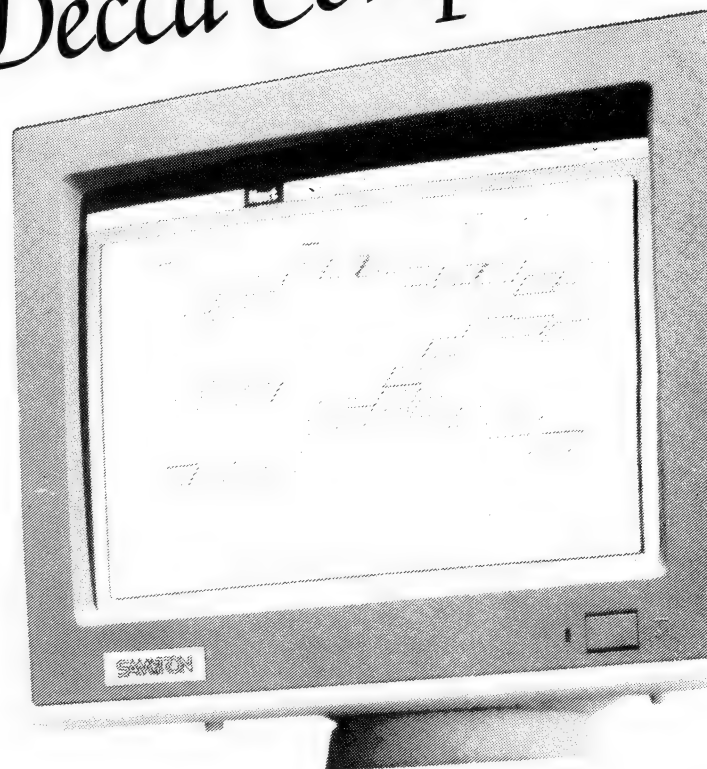
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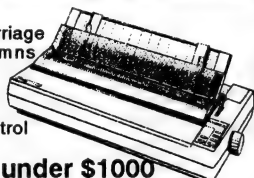
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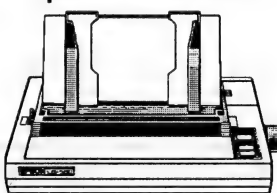
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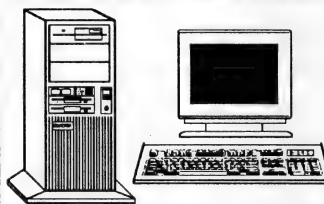
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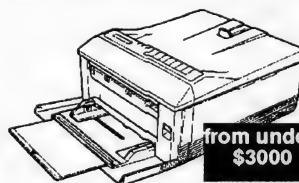
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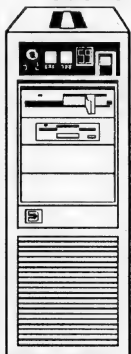


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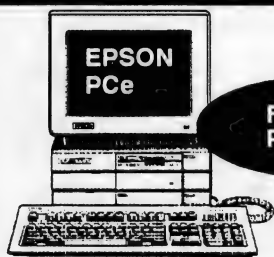
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## COLOR PRINTING



*The QMS ColorScript 100 is a thermal wax printer giving full 300 dpi color output, using the industry-standard PostScript language. It takes about one minute to print an A4-sized page with three or four colors. Priced at \$18,300, it has its own 68020 processor, 4Mb of RAM and 1Mb of ROM.*

these printers, tiny needles deposit an electric charge on the paper. This attracts toner particles which are then fused onto the paper. Some models use three passes to form the color image, while others have three full sets of needles, one for each primary colors. With resolutions up to 400 dpi and paper sizes up to 1 metre wide, they are hard to beat on sheer performance. If your system can drive them fast enough, models like the Calcomp 5800 can produce a full A0 sheet in about a minute. As a result they are starting to replace pen plotters in large CAD installations. All this performance comes at a price though: \$100,000 plus for a large system.

### Colour laser printers

INDUSTRY ANALYSTS have been predicting the release of colour laser printers for some time now. Canon has a color laser photocopier and this machine will soon

be available as a printer. Other manufacturers are known to be working on color lasers but none of the prototypes I know of can faithfully reproduce the full spectrum of Mac II colors, at high resolution and at a reasonable cost.

In fact, there is a good chance that color lasers have missed their opportunity. Given the range and quality of currently available printers, and considering the price and performance expected from color lasers, there may not be a large market for them. If asked to pay \$60,000 for a color laser printer, \$20,000 for a thermal wax printer, or \$5,000 for an inkjet, not too many buyers will opt for the laser.

### Thermal dye transfer

A TECHNOLOGY THAT to some extent resembles thermal wax printing is thermal dye transfer. In this case, the color transfer material is a dye that is vaporized and transferred to a special paper. The main

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*The AMT-5500 is ideal for those who require high-quality color printing and plotting in a single unit. As a printer, it provides the usual Epson, IBM and Diablo emulations, but with the addition of HP-GL support (the industry-standard plotter language) it becomes a versatile plotter. Plot vectors are internally converted to a bit-map for printing, and the printer can plot in 16 colors on media up to A2 size.*

advantage of this technology is that it is capable of printing variable size dots. This makes it much easier to print color shades without the obvious graininess caused by dithering. They are capable of almost photographic quality prints.

Disadvantages are the high temperatures and special paper required. To the would-be purchaser, another problem is the fact that as yet no commercially available printer uses the technology.

US-based Mead Imaging has produced printers using a special paper that is similar to 'carbonless carbon paper'. The paper contains tiny dye capsules called cyliths, which soften when exposed to light. Then the paper is crushed between rollers to make the capsules release their dye. Finally, heat is used to fix the image. This may become a viable technology, but at present it suffers from poor color saturation and expensive paper.

## Printing speed and interfacing

WHILE YOU ARE figuring out which color technology will give you the results you want, another important specification to look at is speed. Note that we are talking here about raw print speed. If your software runs on a 4.77MHz PC XT and has to perform dithering on a 300 dpi printer, it could be 20 minutes or more before you get the end result! In that case, don't blame the printer, but buy move up to a '386 PC or a Mac II instead.

The interface also affects the speed of the printer. As color printing can require eight times as much data as monochrome, you should always use the fastest possible interface. Serial connections such as RS232 or AppleTalk are too slow for most color graphics applications. A Centronics interface can transfer data five times faster, and there are even special versions of it that can transfer almost one megabyte per second. As an example, it can take 20 minutes to send complex PixelPaint images from a Mac II to a monochrome LaserWriter via AppleTalk. Using a modified Centronics interface, the same Mac II can send the image in color to a Tektronix ColorQuick in about 30 seconds.

Graphics workstations that use fibre optics cable for connection to the computer are just coming available. Hopefully, this technology will soon be applied to computer/printer connections, too.

No color printer can as yet match even the slowest laser printers. Typically, printing times range from about two minutes for an A4 page to six minutes for an A3 page, depending on the complexity of the image being printed. Of course this also



*Many 9- and 24-pin dot matrix impact printers are capable of printing in color, which often involves merely using a color ribbon. This ribbon fits the NEC P5200 and P5300 24-pin printers.*



## COLOR PRINTING

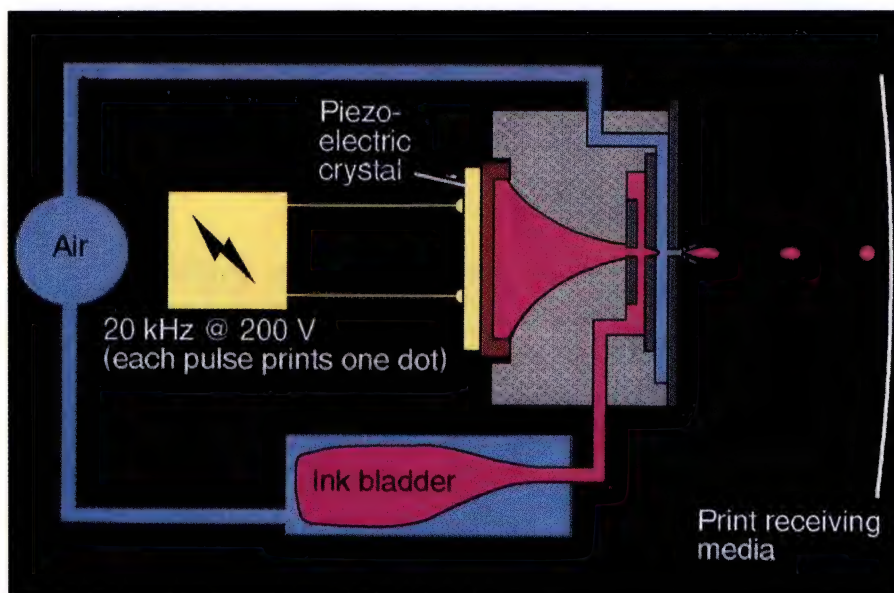
depends on the software application and the speed of the computer's CPU.

Color PostScript printing can be really slow and printing graphics using color PostScript output really puts the brakes on. Plugging your color printer into a network so that it won't tie up your PC doesn't solve the problem either because color printing presents a real challenge to most networks.

One solution is to add a Tektronix Phaser Print Station to the network. The PrintStation supports Tektronix' Color-Quick and Phaser Thermal Wax printers, provides a highspeed PostScript interpreter, a fast interface that can transfer almost one megabyte of data per second, a 40Mb print spooling hard disk which stores fonts locally, queues print jobs and images and network administration software which minimises the impact of color printing on your network.

### Using color

BEFORE YOU DECIDE to go out and buy a color printer it is helpful to understand the limitations inherent in color printing. In the ideal situation, such as with a Mac



As can be seen in this cross section of the print head in a Tektronix 4692 inkjet, electrical pulses are used to propel the ink toward the paper when a dot of a particular color is required. An electronic signal generates a pressure pulse by flexing the piezo-electric crystal on the back of the printing head. The horn-shaped chamber amplifies the pressure pulse and produces a droplet of ink.

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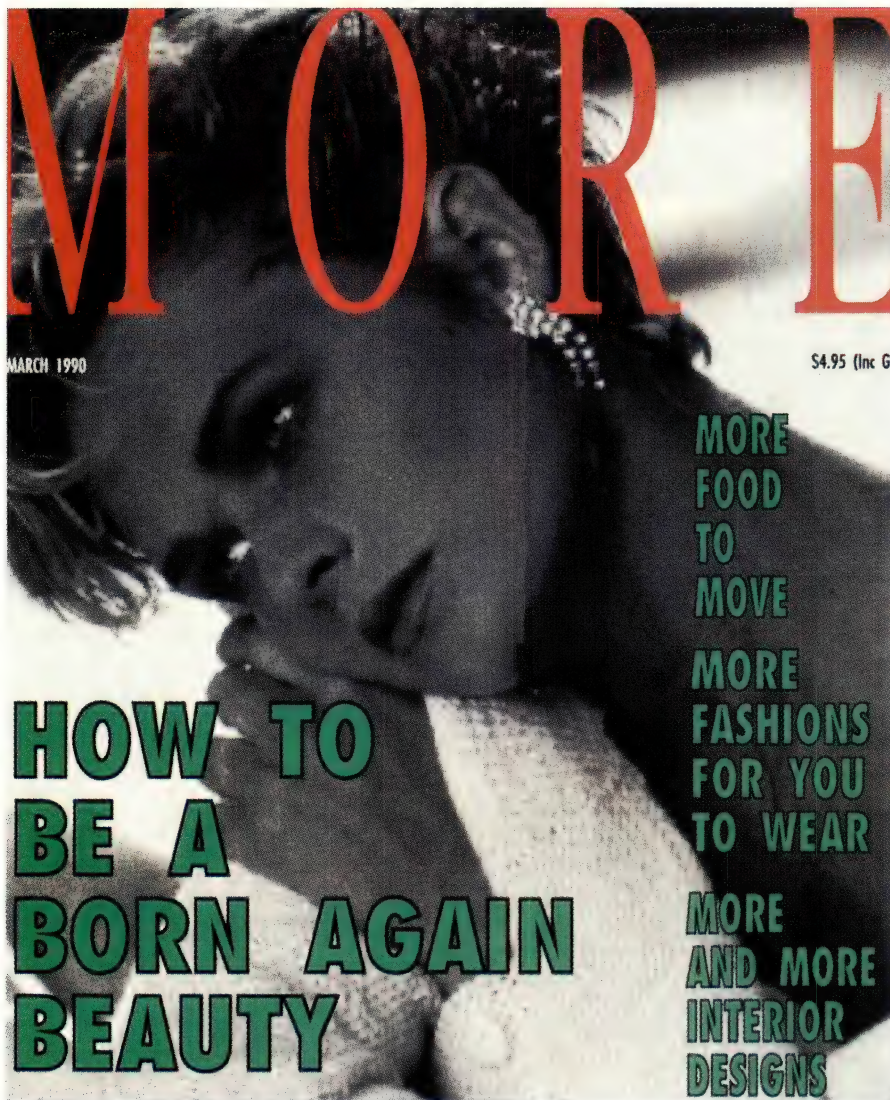
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the 'full' range of 16 million colors, there are shades that can not be produced on either.

There are other effects that stop the printer from accurately reproducing the screen colors. One that is often overlooked is the CRT's calibration. Try putting several CRT's side by side, all displaying the same color graphics, and notice the differences. This is very noticeable in the TV section of department stores where no two TV sets show the same color. Adjustments inside or outside the set let the

---

*In many cases, a quality color printer will cost as much as the computer it's plugged into, so take your time before making a choice.*

---

user or the technician vary the colors. Most manufacturers adjust the color purity to in-house standards before the monitor leaves the factory. So you can be confident about the colors as long as the monitor is regularly calibrated by a qualified technician. But no one notices minor color changes that happen over months or years, so it is worthwhile having the monitor recalibrated from time to time if color is important in your work.

## Matching colors

A MORE ANNOYING problem results from the fact that the inks or waxes used in printers do not accurately match the CRT colors. Typically the printer's cyan is too blue, and the magenta, too red. As a result most colors shift in hue so that blue looks purplish and green shifts towards blue. Until manufacturers produce better matching inks and waxes, the only solution is for printer drivers to reverse that shift. This is not too hard on the Mac, where all applications use the same drivers. On IBM compatibles, each application comes with its own drivers, which makes this much more involved. One of the most practical uses of a color printer is for color proofing of material for publication. Nearly all design studios have to go through a proofing process using either

*Full-color printers are great news for desktop publishers wanting to produce cover proofs without the time and expense of more traditional proofing methods – this sample was produced on a QMS ColorScript.*

II, the computer can display 16 million shades of color. Top of the line printers can print a similar number, yet the printed colors often do not look the same as screen colors.

To explain this apparent paradox we must start by realising that on the screen, the colors are produced in a way that is inherently incompatible with the way printers produce them. On the screen the three primary colors (red, green and blue) are generated by the phosphors. Mixing them produces all other shades. Because the light is produced on the screen, the colors look best if there is no other light around,

and the room is in complete darkness. Any external light tends to 'wash out' screen colors.

On the other hand, printed colors require an external light source from which each primary color (cyan, magenta and yellow in this case) subtracts certain wavelengths, leaving only those that the eye perceives. Up to a point, the brighter the light source, the more brilliant colors appear. As a result, some colors can be produced on the screen, but not on paper, and vice versa. Try printing a bright light source to see what I mean. Also, even when both screen and printer can produce



machine proofs or chromalin proofs to show exactly what the output from the printing press will look like. Once again this is an industry wide problem which results from the fact that the inks used on printing presses do not accurately match CRT colors.

Going through this proofing process takes time and costs money. When you are on a deadline there is always very little time to make amendments to color hues, shades and tones on the screen and repeat the proofing process until you get a good color match.

Using a high quality color printer to proof artwork gives in-house control over the four color printing process. Any discrepancies can be seen and fixed on screen before sending disks to have film made. It also makes changes to color choices easy to make and check for visual effect.

To get the best possible color quality requires a top-of-the-line printer. When shopping around for a printer, ask each supplier to produce some prints on paper and slide film to your specification. In many cases, a quality color printer will cost as much as the computer it's plugged into, so take your time before making a choice. Look at several, at least, and consider speed, the evenness of printed colors, the cost per copy and the availability of service. Regardless of what the sales person or the brochures might say, give the printer a workout with your computer and software.

Finally, unless your printed output in-



volves photographic reproductions, do not worry too much about matching the printed output to the screen. Just concentrate on the printed output quality. After all, that is what your audience will see.

As is usual in the computing industry, today's top-of-the-line machine will be

only barely acceptable tomorrow. As you can see, there is still no technology that will revolutionise color printing the way lasers did for monochrome. Each of the various technologies has its advantages as well as its weak points – so consider carefully before committing yourself. □

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# CHOOSING A WORDPROCESSOR

The first software most users want to buy is a wordprocessor, but deciding between the staggering number of packages and vast range of features can be daunting even to experienced users. Using three popular packages as examples, Bruce Iliff considers the choices . . .

**W**ANT A GOOD excuse to buy a PC? A computer with a word-processing package can be an invaluable tool in the home or office. A wisely chosen package can be used for more than just letter writing: it can be used as a mini-database or small spreadsheet, even to the point of generating invoices and doing calculations on them. Of course a printer is vital –

it's no use typing in granny's 300 recipes and then having to lug the PC into the kitchen, or typing business letters and having no way of mailing them, for that matter.

If you thought hunting for the right hardware was a mammoth task, finding a suitable wordprocessing package can be even more daunting. Every publisher of wordprocessing software has added a host

of features with each new release, trying to outdo the competition. But, for most of us the 90/10 rule applies: 90 per cent of users will use only 10 per cent of the features, and vice versa. So be warned – don't get caught with a powerful package, most of whose features you will have no conceivable need for. For example, many word-processing packages now have basic desktop publishing facilities built in, but at the cost of precious RAM and dollars which will be wasted in many applications.

Most of the more popular packages are now offered in several versions – a feature-rich one for heavy duty wordprocessing and a stripped-down version ('for the busy executive', as it's described by one supplier) with the essentials. Basically, a wordprocessor does exactly that – processes words. With the old typewriter, changing a word meant rekeying the entire page.

So, what should a wordprocessor have?



For a start this 'cut and paste' facility. Without it, you might as well stick to the typewriter. It should have good file handling facilities, which means you should be able to locate files quickly and easily. And, once located, it should be able to manipulate them (for example, deleting, moving to other directories, or renaming them). This might not sound important when starting out, but after you've got hundreds of granny's recipes or numerous letters to clients collected over a few years, good file handling is essential.

Before making a choice, you should try at least three different packages, over a range of prices to get a feel for what they can do and how easy they are to use. The features you are likely to use the most, should require the fewest keystrokes – take a short, sample letter with you and type it in at the dealers: that will soon acquaint you with the package. For example, try marking and moving a block of text, changing the margins and then re-formatting the paragraphs to fit the new margins, and spell checking the letter.

How easy is it to move the cursor around the screen? With some packages, the easiest way to move the cursor is with a mouse, but taking your hands off the keyboard can be distracting and counter-productive. If tab settings are used in your documents, try setting and changing them. Does the package have decimal tabs, that is, the ability to align the decimal point in a column of figures?

Another useful feature is compatibility between packages. You might have WordStar on a PC at work, and PC-Write at home, say. The advanced wordprocessors have facilities that can convert files from one format to the other. If you are likely to send a standard letter to a number of addressees, how easy is it to mail merge with the package?

No matter what PC, printer or wordprocessor package you have, getting hard copy output can be a nightmare. If the wordprocessor doesn't have a driver specifically for your printer, it could take forests of paper, numerous ribbons and frayed nerves before you can get it to print in bold or italic. Don't take anyone's word that the two will work together, unless your printer is specifically mentioned in the package – try it yourself if you have any doubts. Some sort of preview before printing is important. Advanced packages use graphics to show the page as it will appear after printing, while others show it in normal screen text.

There are other features that the expen-

sive wordprocessors are including these days. They have macros, for example – these allow the package to 'remember' a frequently used series of keystrokes, so it can be 'replayed' by pressing only one or two keys. Many packages now have graphics capabilities, so pictures and text can be included on the same page. This sounds impressive, but would be a bit complicated for granny's recipes or a small business simply writing letters. Some packages even include communications capabilities.

Nearly all the packages aimed at the business market have a spell checker and thesaurus built in. With the thesaurus, if you don't like a particular word, or it doesn't fit, a list of replacements will be displayed and one of them can be chosen to automatically replace the word in question. With the spell checker, a list of suggested correct spellings should be displayed – choosing one of them should be straightforward.

Most wordprocessors available have some mathematics capability which is useful for formulating small spreadsheets and doing simple calculations within a document. Simple invoices and statements can often be generated this way.

Now, let's look at three quite different packages to give an idea of the range of features you are likely to encounter.

### WordPerfect 5.1

WORDPERFECT HAS ALL the features anyone could want in a wordprocessor.

Macros, graphics, newspaper column layout, spell checker, thesaurus, easy setting up of tables and forms and 'warm links' to other packages, to name a few.

It boots quickly and gives an almost blank screen, resembling a blank page of paper. The cursor is in the top left corner. In the bottom right is a small line giving the cursor coordinates. From this screen, either a new document can be typed in or the excellent file handling facility can be accessed with one key stroke.

In any package, certain codes have to be entered to give the desired output, such as paper size, margins, headers, and footers. With a lot of wordprocessors, these codes are shown on the screen. WordPerfect, in its attempt to keep the screen like a blank page, keeps them hidden. They can be viewed at any time by a single key-stroke that splits the screen showing the document in the top half and the document with codes in the bottom.

WordPerfect's Australian version bases its spell checker and thesaurus on the Macquarie Dictionary. This localises its spelling so it's compatible with common standards.

One of the major letdowns with WordPerfect is its help facility. It is an awkward setup using a 'tree' arrangement to work down to the final answer. Once you're familiar with the package, the help facility isn't used, but it's handy if someone else is. Granny might want to key in her own recipes!

The functions available are all accessed

```

09/10/89 11:01          Directory C:\WORD\1.*
Document size:          0 Free: 3422208 Used: 1836276 Files: 35

. <CURRENT> <DIR>
AUXIL . <DIR> 13/02/89 07:45
RIGHT . <DIR> 02/04/89 19:59
EGAITAL .FRS 3584 14/07/88 12:03
EGAUND .FRS 3584 14/07/88 12:03
EPLQ850 .PRS 8710 02/05/89 18:15
EPLXB00 .PRS 5482 02/05/89 18:13
HRF12 .FRS 49152 14/07/88 12:03
KEYS .MRS 4800 14/07/88 11:49
PTR .EXE 205312 14/07/88 12:03
STANDARD.PRS 1025 02/05/89 18:14
WP .DRS 73400 14/07/88 12:03
WP .FIL 300378 14/07/88 11:49
WPHLP .FIL 47556 14/07/88 11:49
WPSMALL.DRS 13798 14/07/88 11:49
WP(WP)UK.LCN 16 11/11/88 10:35
WP(WP)UK.THS 361922 14/07/88 11:56
WP(WP) .CHK 0 09/10/89 11:01
WP(WP) .TVI 0 09/10/89 11:01

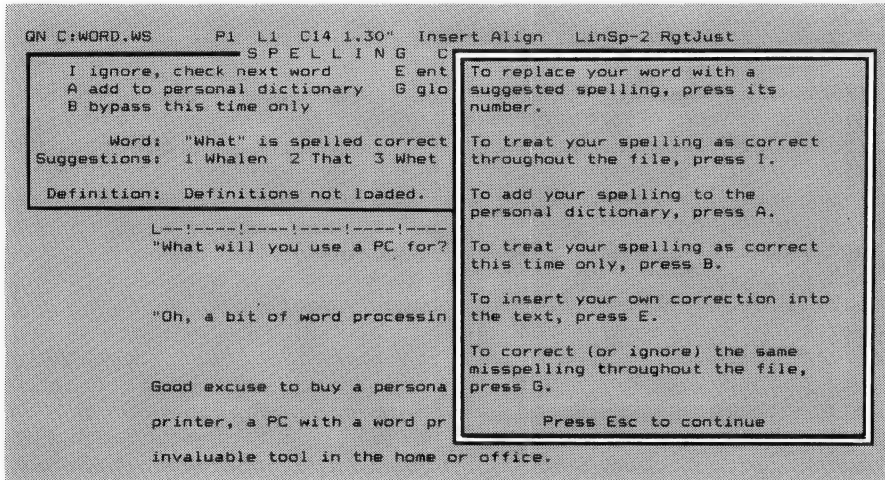
.. <PARENT> <DIR>
FILES . <DIR> 11/02/89 13:26
EGAS12 .FRS 3584 14/07/88 12:03
EGASMC .FRS 3584 14/07/88 12:03
EPFXB0 .PRS 5507 30/07/89 19:39
EPLXB0 .PRS 5439 29/04/89 13:23
EPLXB01 .PRS 5482 01/05/89 20:32
HRF6 .FRS 49152 14/07/88 12:03
LXB00 .PRS 5439 29/04/89 13:22
SPELL .EXE 39424 14/07/88 11:56
TEMP .PRS 8710 11/11/88 10:40
WP .EXE 249344 14/07/88 11:49
WP .MRS 3756 14/07/88 11:49
WPHLP2 .FIL 52175 14/07/88 11:49
WP(WP) .SET 4987 09/10/89 11:01
WP(WP)UK.LEX 316878 14/07/88 11:56
WP(WP) .BV1 0 09/10/89 11:01
WP(WP) .SPC 4096 09/10/89 11:01

1 Retrieve; 2 Delete; 3 Move/Rename; 4 Print; 5 Text In;
6 Look; 7 Other Directory; 8 Copy; 9 Word Search; N Name Search: 6

```

*WordPerfect's file handling is excellent. They can be easily renamed, printed, or deleted. Or, you can move to another directory or import an ASCII text file. Another feature is searching – you can specify a word pattern and WordPerfect will mark which files it appears in.*





*WordStar's Help facility is so straightforward even granny could use it. Wherever you are in the program, hit one key and a small help screen appears. Help levels can be set, so it can be a simple reminder or go into detail.*

through the Function keys. Using Alt, Control, Shift, and the key on its own, gives four different functions for each key. When any function is accessed, a one line command appears at the bottom of the screen leading to further operations. As easy as this sounds, if you are using an 'enhanced' keyboard – one with the Functions keys across the top – using these keys can be as distracting as having to take your hands off the keyboard to use a mouse, particularly when you have built up your typing speed.

### Product Details

**Product:** WordStar 5.5  
**Distributor:** WordStar Australia  
 Suite 52  
 Neridah & Albert Ave,  
 Chatswood NSW 2067  
 Ph: (02) 411 7255; Fax: (02) 411 6129  
**Price:** \$625

**Product:** WordPerfect 5.1  
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**Product:** PC-Write  
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### WordStar 5.5

LIKE WORDPERFECT, WordStar is one of the advanced wordprocessors on the market. It has all the features – graphics, spell checker, thesaurus, macros, maths, plus others.

The complete package (there are three different versions available) comes with an outliner (PC-Outline) which can help keep certain jobs organised. It's useful for arranging your thoughts before starting to write a complex document, or to sort lists; it can also be used as a simple project manager.

WordStar's file handling isn't as straight forward as WordPerfect's, but included is another package that is useful for this task – Profinder. It can search the current directory for files that contain a certain word, it then sorts and displays the file list by size, extension or whatever way is required.

The page preview in WordStar is first class. It has various ways of displaying how the final print will look – it can show all the pages on the one screen, a close-up of part of a page, or one page at a time. It can also display a detailed grid which is useful when combined with graphics to get the perfect layout before printing.

WordStar uses two methods of performing tasks – a pull down menu, or a set of keystrokes, usually in combination with the Control key. For speed typists, this is easily the most efficient way to perform tasks – the hands never leave the central keys.

Another feature of WordStar is a com-

munications facility. This is useful if granny wants to send recipes to her friends, or for a multitude of other uses in this age of electronic transfer (naturally, a modem is needed).

### PC-Write

FOR ITS PRICE, this program is surprisingly powerful. When you register, you will get a hard bound copy of the complete manual and any information on updates. Also, there is a copy of a condensed manual on the disk which is adequate.

It's one of the most common wordprocessing packages and has all the basic features found in the expensive ones (macros, cut and paste, word searching, spelling checker and so on). It even has the ability to use a mouse, though, as mentioned above, this can often be counter-productive than anything else. It has adequate file handling facilities and supports a wide range of printers. Access to commands is similar to WordStar – use either a sequence of keystrokes or a basic menu.

But, it doesn't have all the fancy features like graphics, thesaurus, or communications. However, it does have a rudimentary help facility (though it is awkward to use). Another feature lacking is a preview before print. All in all, as a basic wordprocessor, it is excellent value for money.

If you have a business and will be doing a lot of fancy work with graphics and require desktop publishing ability, then choose one of the advanced packages. WordStar and WordPerfect have similar features and price – try them, and Microsoft Word when you are deciding, to get an idea of the range of features that is available at the top end of the market. The choice of a wordprocessor can be a 'personal' one, so it's important to get the 'feel' of the alternatives. Also, shop around: street prices can vary as much as 20 or 30 per cent. □





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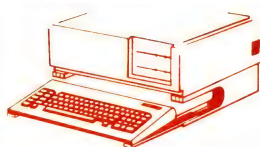
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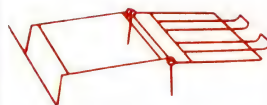
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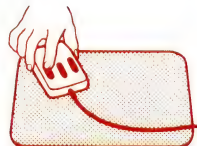
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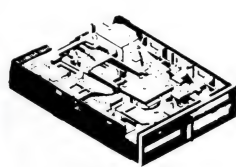


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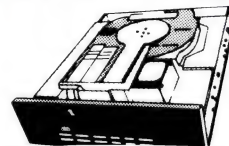


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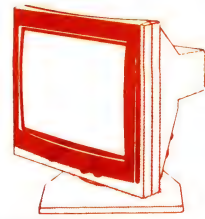
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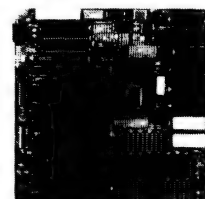


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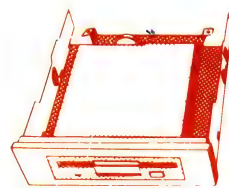
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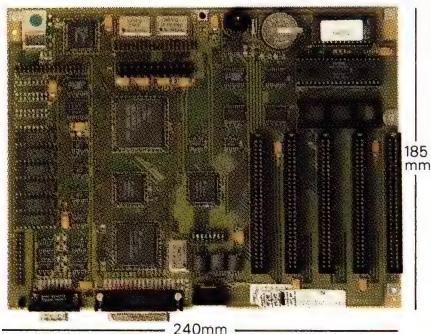
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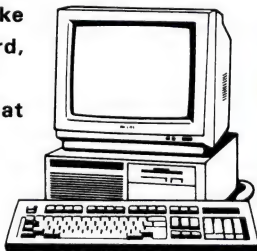
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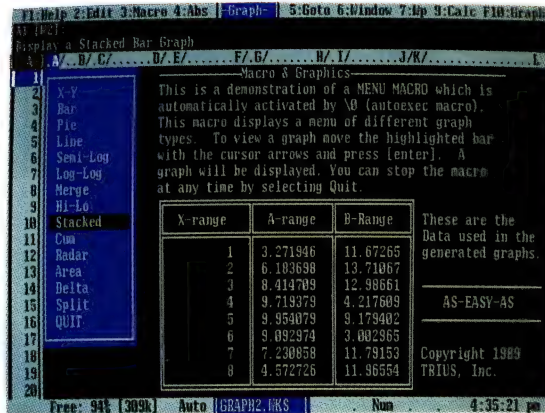


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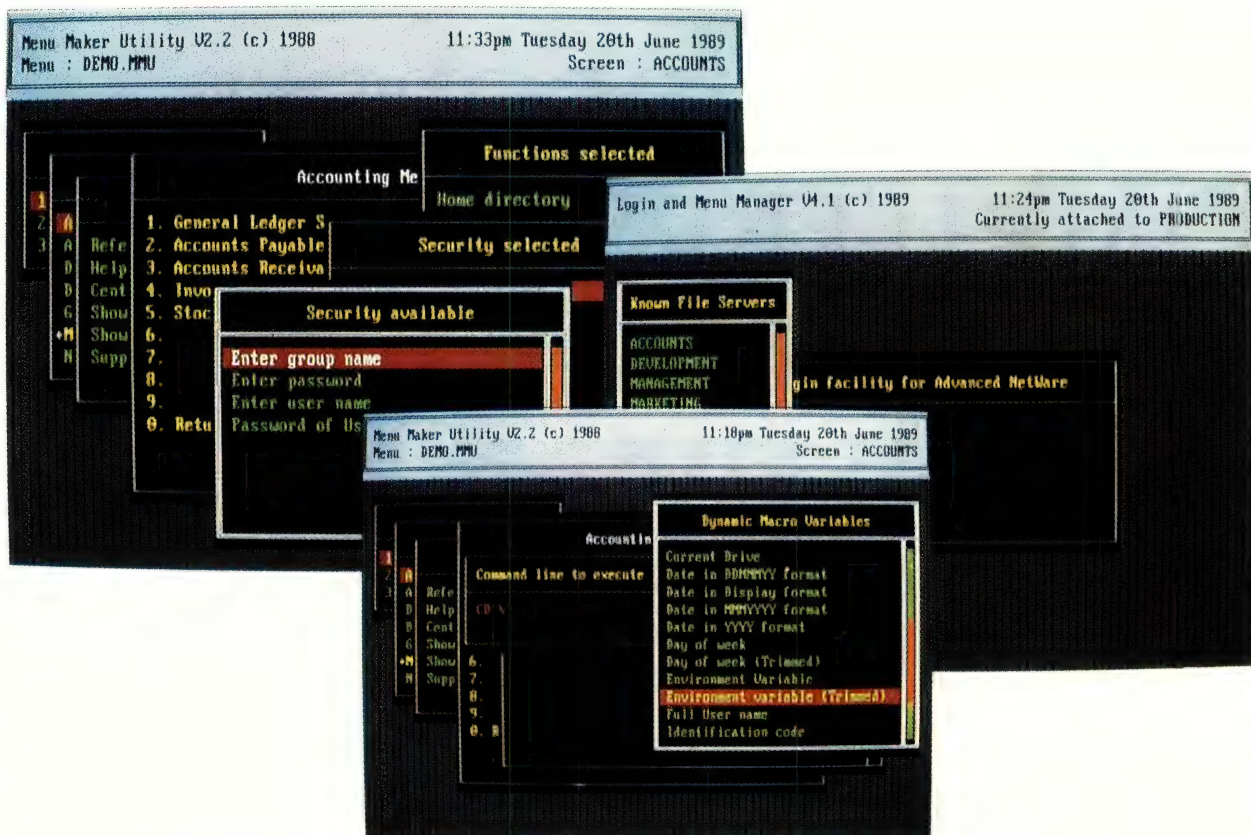
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# A PARADOX IN PARADOX 3.0

**A**FTER REVIEWING over twenty database products, it's a delight to find one that allows enthusiasm. Paradox 3.0 has almost everything going for it. It is fast, its interface is intuitive and a breeze to drive, its multi-table forms are the best I've seen within the standard relational model and query by example kills SQL as a way of extracting information from a database.

It has one quirk: while you can create as many 'secondary indexes' as you like to speed up querying, you can have only one primary index which determines the order in which records appear on screen when you first load a file. dBase, Open Access, ZIM and many other products let you create numerous 'primary' indexes, and change the on screen sequence of records by switching the order of index files.

On first glance this made it appear that to make use of its strongest features (multi-table forms and table lookups) you would be forced to access your information in one order only – you couldn't sequentially process your customers in alphabetical order if you use a unique customer code for each of them. In practice that is not the case. You can process your records in any order you desire, using a work-around which employs the Query by Example system which Paradox pioneered.

Overall, Paradox belongs in the first rank of PC databases, along with my earlier Gang of Six: Revelation, ZIM, Open Access, R:Base, Meta5 and Clarion. It has finally become what it was touted to be when version 1 was first released, several years ago: a dBase killer. The only problem is this field is now more crowded.

## Earlier releases

PARADOX HAS had three lives thus far. When it was first released, it was touted as 'the dBase killer'. This it was not, despite novel features such as its query by example mode, its Lotus-like menus and its extensive use of RAM in what is normally a disk-based area.

Steven Keen continues his Database Data series with a product so feature-rich and fast, he can forgive its limitations.

---

Its second incarnation (under Borland's control) introduced a number of enhancements, but the package was fatally flawed by a series of Catch-22 design limitations. The worst afflicted what I regard as key aspects of a decent relational database: data verification and access to data in other tables. A relational database should provide verification that any products sold actually exist, that customers are on the books and so forth. Paradox 2 offered this: if you typed an invalid customer code into an invoice form, a pop-up window could be generated showing valid codes.

Paradox's limitation – its own paradox – was that this window could only be in customer code order. If you wanted to find the code for a particular customer when all you knew was the name, or postcode, you had to search for it in an effectively unsorted table. This was easily outclassed by Open Access' system, which lets you see the customer database in order of any indexed field and transfers the code back to the invoice database. Clarion, Revelation and Meta5 all offered similar, and sometimes superior features.

Naturally, top of my wish list for Paradox 3 was that it be able to maintain a number of keys to a table – so that it could be shown and processed in code order, surname order, whatever. Borland didn't play Santa Claus. Paradox's lookups are still limited to a single key; but a number of new and unexpected goodies overcome most of the damage that this restriction once imposed on a Paradox database.

## User interface

PARADOX HAS the best user interface in the database market, combining the best of databases and spreadsheets in one product. Its menu system clones 1-2-3, but it exceeds Lotus with the ability to display multiple tables on screen simultaneously, and move between them with the press of a Function key. Function keys also cover moving between table and forms view, selecting fields for a query, executing a command and so on. The Menu/Function key combination is extremely easy to learn, and very powerful.

The vast majority of databases load one record per table into a buffer at a time; Paradox loads as much of each table as will fit into RAM, with consequent near spreadsheet speeds of data access. As a result, you tend to treat Paradox as something of a spreadsheet, flipping between tables rapidly and paging up and down through them; it results in the best 'hands on' feeling for your data that I have experienced.

Paradox doesn't have a data dictionary (one of its two major failings), so you are best advised to reserve one Dos subdirectory for each database, and store all your tables in it. You define a table by filling in entries in another table called STRUCT, which has fields for Field Name and Field Type; when you finish, Paradox uses the records of this table to define your new table. Paradox supports a currency data type (useful for accounting applications) as well as number, integer, date and string.

The first clue to Paradox's paradox comes at this stage – if you want to index the table, then the key fields must come at the beginning of the table in key order (major key first) until you have a unique index. No unrelated indexes are allowed (though you can create secondary indexes to speed querying), and an indexed table can have a maximum record size of only 1350 bytes, compared to 4000 bytes for an unindexed table.



Viewing Orders table: Record 1 of 97 Main

ORDERS	Customer ID #	Product Code	Quantity Ordered	Product Name
1	1045	FPC-Y	4	Orange
2	1045	HAN-K	1	Raspberry
3	1045	CYK-L	2	Rose
4	1045	LL3-E	2	Mix
5	1045	HAN-L	1	Apple
6	1045	FPC-T	23	Aniseed
7	1045	HAN-J	1	Lemon
8	1045	FPC-D	2	Grape
9	1191	FPC-D	2	Grape
10	1191	FPC-T	2	Aniseed
11	1191	HAN-L	3	Apple
12	1218	FPC-Y	2	Orange
13	1218	LL3-E	6	Mix

Viewing Orders table with form F: Record 1 of 97 Main ==

ORDER ENTRY INFORMATION				
Product Code	Description	Size	Quan	Price
FPC-Y	Orange	2L	4	25.00
HAN-K	Raspberry	2L	1	25.00
CYK-L	Rose	4L	2	47.50
LL3-E	Mix	2L	2	47.50
HAN-L	Apple	4L	1	99.95

**Figure 1.** Paradox achieves near spreadsheet speed by loading as much of each table as will fit into RAM. As a result, it's possible to flip rapidly between different views of the order information data, for example.

## Data entry and editing

ONCE DEFINED, YOUR table appears on screen in tabular layout akin to Browse in dBase, only much faster. You can enter data by choosing Modify/Data Entry from the menu, edit it by choosing Modify/Edit. You can switch from tabular entry to forms entry simply by pressing F7, which toggles between the two. If you haven't previously defined a form, Paradox constructs a default one for you.

At this basic level, Paradox leaves most other packages for dead for ease of use and speed: the only one to come close on both counts is Open Access. As well as browsing through your database, you can search on any field (invoked by typing Ctrl-Z for Zoom). Once you have become accustomed to Paradox's case-sensitivity

and to using .. and @ as wildcards rather than \* and ?, its searching is excellent.

You can also continue to define your database from the Data Entry mode by adding conditions ranging from minima/-maxima for fields to the most important, lookups to other tables. These provide the ability to, for example, quickly consult the product table while entering a sale into the invoice table. Once a lookup is defined, to use it you simply press F1 when on the relevant field in your primary table. Rather than getting Paradox's excellent on-line help, you get the table you wish to consult. You can then move to any column in that table and search for the value you want; press F2 when on the correct record, and the key is automatically returned to your primary table.

But there are restrictions on the design of table lookups. If you use a unique product code, that code must be the first column in your product table, it must be indexed, and there can be no other parts to the index key (you can't include product name in the index, for example).

## Forms design

LIKE R:BASE (and similar in effect to Advanced Revelation's far more sophisticated multi-valued fields), Paradox 3 supports multi-table forms: forms which show information from more than one table at a time. Designing them is easy. First define single table forms for each table; with one of them and (preferably) give it the ability to show several records simultaneously (using a scrolling region). Then load the primary form again (student table in a marks database, invoice in a sales database) and merge the second (or additional) forms.

You can now use the form to view, edit or enter records into multiple tables, with Paradox transparently taking care of data integrity: if you change the key field in the master, the key field in all the records in the related database are also altered.

Paradox, like Revelation, Open Access and Clarion (but not R:Base), allows an operator to consult one table when entering data into another - for example, to consult the Salesmen database when filling the 'Salesman's ID' field in an invoice table. The operator may know that the salesman was Joan Rivers, but can't remember her ID number. All these programs let the operator quickly refer to information in the salesman table, lookup the required name, then press a key to transfer the data back to the invoice table automatically.

Revelation and Clarion let you hand tailor the information shown to the user with pop-up windows: your pop-up for salesman's ID could show surname in its first column, first name in its second, and the ID number in its third. Pop-ups in both programs have automatic search built-in: type all or part of the surname you are looking for, and the window automatically moves to the first match. Press Enter in either, and the salesman's ID number is automatically filled in the invoices form.

Open Access isn't so flexible at first, but it exceeds in the degree of access it allows to the related table. If the operator types an invalid number into Salesman's ID, OA pops-up a half-screen window showing all the valid numbers. Press the right-arrow key, and it moves on to the next keyed



field in the Salesman table, which could be surname; you can search for a particular name, as with Revelation and Clarion. But if the name hasn't been entered yet, by pressing Ctrl-Enter the operator can call up the Salesman form, enter the new salesman's details, save it, and then transfer this information to the Invoice database.

Paradox has the same ability. But it causes problems with its related restrictions on indexing – the primary index field must be the first in the database, the secondary, second and so on, and a lookup table can be indexed only on the first field. An indexed database can't be displayed in sorted order (that is, on any order other than that of the cumulative key fields).

*It works, and while circuitous, the overall effect is as good as with Advanced Revelation, and superior to R:Base.*

Take a student assessment database, with tables for students, assessments and marks. Each student has a unique student number (SN), making SN a prime candidate for the primary key. However, if it is made, then the table will always appear in SN order, which bears no relation to alphabetical order. Yet when the staff mark exams, the papers are sorted into alphabetical order by surname and initials.

In version 2 of Paradox, this defeated the table lookup features, because the lookup only consulted the first column in the related table.

To enter data into the marks table in alphabetical order, the Students database had to be keyed first on Surname, then Initials, and finally Student Number. A Validity check on the Marks database (to make sure that you don't enter an invalid student) looks up only the first column of the Students table – so for a start, you have to add Surname and Initials fields (redundant data) to the Marks table. But far worse is the fact that your first column in the Students table (Surname) is not always unique.

The end result is that with a database set up in this fashion, Paradox 2 lets you enter marks for the first of 11 Chans, say,

Viewing Customer table with form F: Record 1 of 915 Main —

Order Information Form

Customer Identification	Customer Detail
Customer ID #: 90 Customer's Name: Ali Tarta Pty Ltd Addr1: 51 Pini St Addr1: W.Melbourne 3003 Vic Contact: Karl Marks	Priority: 4A Credit : 31.2 Credit Balance: 23450.00

ORDER ENTRY INFORMATION				
Product Code	Description	Colour	Quan	Unit Price
WDG-1	Small Widget	Black	1C	725.00
WDG-N	Small Widget	Nylon	1M	725.00
GRM-1	Grommet	Red	2C	247.50
PLG-2	Plug	Red	1M	247.50
WDG-4	XL Widget	Black	1C	99.95

**Figure 2.** Paradox has a powerful facility to display multiple tables on screen simultaneously, and move between them with the press of a Function key. The program's Menu/Function key combination is extremely easy to learn, and very powerful.

in a class, but not the other ten: if you use the lookup function, Paradox 2 returned the details for the first match on your non-unique first column, ignoring the values in the other matching records. This, of course, is intolerable. The only option was to return to having the unique Student Number as the first field in the Students table – but this restores the problem of not being able to enter student's results in alphabetical order.

Fortunately, Paradox 3.0 provides two features which overcome this problem. Firstly, if you put the student table into alphabetical order by making the index a composite of surname, initials and student number, the lookup makes sure that all matching fields are the same. Secondly, there is a work-around which lets you process records in any sequence you want, regardless of what the primary index is.

Fittingly, since Paradox pioneered the Query By Example approach to manipulating a database, the solution to this paradox involved QBE. A Paradox table,

once it has been indexed, cannot be displayed in anything other than index order; and only one primary index is possible. However, an Answer table, derived from an indexed table, can be sorted into any order you like. The results of editing that table can be posted back to the main table, effectively resulting in the effect I wished to achieve.

This works even with multi-table forms. First, use QBE to make up a table containing all the information in the Student table. Then sort this table on Surname, Initials and Student Number (in that order). Next use the Tools menu to Copy a Form from the Student table (this being a multi-table form, allowing data entry into both the Student's table and Marks table). Then pick that form, and use it to edit the Answer table. When you have finished editing, any marks added for students are entered into the Marks table, while any changes made to student details in the Answer table can be posted back to the Student table.



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## DATABASE DATA

It works, and while circuitous, the overall effect is as good as with Advanced Revelation, and superior to R:Base. Paradox hence belongs right at the top of the heap of relational systems. But a bit of a kludge is forced upon you by quirks in the design. Open Access, Revelation and Clarion all have the ability to do table lookups on any field you want, in any order. Paradox should be able to offer the same.

### Querying

PARADOX PIONEERED the query by example approach of finding information from related tables, and it is certainly a superior method to writing an SQL sentence. Paradox also has the advantage that the last query is stored in memory, letting you fine tune the request if you didn't quite get the result you expected from the last try.

With QBE, if you want to link tables on common fields, you press F5 and enter the same example element in each column. So, a query to link customers to orders would have the example element 'abc' entered into the customer ID fields in each table. Extending the link to a product table (to show product descriptions rather than just product IDs) involves typing a different example element (say '123') into the product ID columns in both the orders and the products tables.

You nominate which fields to retrieve using the F6 key. Nominated fields will be displayed in the answer table. Finally, you apply conditions to the retrieval by simply typing them in to the relevant field (say < 100000) in the credit limit column of the customer table, 'Robot.' in the product description column of the product table, and that limits your retrieval to those customers with a credit limit over 100000 who have bought robots.

Paradox has built-in graphing powers which exceed those in most integrated packages (apart from First Choice) let alone those in the few other database programs with graphics (such as Reflex and PC Express). Not only is a wide range of graph types supported, but the graph types can be mixed on the one image. The limitation, predictably, is with the text on a graph; it is bit mapped, and therefore doesn't come with cooee of the results you get from a dedicated graphics package such as Harvard or GEM Graph.

Paradox includes an Applications Generator (doesn't everyone, these days?), keyboard macros of considerable power (borrowed from spreadsheets and editable, as they are in spreadsheets) and

miniature programs called mini-scripts. Any of these can access Paradox's own menus, as well as letting you define your own. The programming language (PAL) is far richer than that of dBase, and includes full support for multi-user operation.

I truly enjoyed using Paradox. Its features are so rich and speed so great that the limitations on indexing can be forgiven. Nonetheless, I would love to see Paradox evolve away from its limitation to only one primary index. I expect that this limitation arises because the index also has to be unique. If Paradox could be enhanced to support additional non-unique primary indexes, or to allow several unique indexes, then the work around needed to allow processing of records in any order would be unnecessary.

Overall, Paradox 3.0 shares top billing with Advanced Revelation as the best relational database on the market. Revelation has the edge in database design, with its powerful dictionary, top of the line security, its accessing system (which overcomes the speed problems that indexed files suffer as they grow), and its unique multi-valued fields (which let you store all the information you want in one record without breaching the principles of database design).

Paradox has the edge in speed, ease of use, the ability to run most aspects of the system from a simple menu, a more decipherable programming language and far superior manuals. My dividing line between the two packages would probably be networking, number of users, and complexity of the application. While Paradox supports networking very well, as a system grows, Revelation's linear hash table indexing must give it a performance edge, and its dictionary makes maintaining and expanding a complex application less troublesome. But, for small to medium businesses, especially where there is a desire to do all the development in-house, Paradox is a clear winner. □

### Product Details

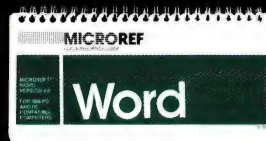
**Product:** Paradox 3.0  
**Distributor:** Tech Pacific  
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For small to medium businesses, especially where there is a desire to do all the development in-house, Paradox is a clear winner.



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Formatting Text	Using Format Codes	Special Effects	Page Layout	Window Management	Help
Default settings for future documents . . . . . Shift F1 Create and use style sheets . . . . . Alt F8 Change line format . . . . . Shift F8 1 (Tabs, margins, spacing, hyphenation, alignment) Change page format . . . . . Shift F8 2 (Page length/numbers, top margin, header/footer) Change document summary/defaults . . . . . Shift F8 3 Change other format settings . . . . . Shift F8 4 Display tab ruler . . . . . Ctrl F3 1 Respond to hyphenation prompt: Word wrap/require word . . . . . F1 Insert a hyphen . . . . . arrow keys Esc Reveal or hide codes . . . . . Alt F3	1. To reveal codes, press . . . . . 2. If desired, type new text and delete codes 3. When finished, press Alt F3  <b>Searching and Replacing Text or Codes</b> Search forward . . . . . F2 Search backward . . . . . Shift F2 Replace forward . . . . . Alt F2 Specify text . . . . . text Specify code . . . . . formatting key Begin search . . . . . F2 Extended search forward . . . . . Home F2	Align on tab . . . . . Bold . . . . . Center . . . . . Change font . . . . . Hard hyphen (no break) . . . . . Home - Hard space . . . . . Home Spacebar Hyphen (allows break) . . . . . Right align . . . . . Alt F6 Superscript character . . . . . Ctrl F8 1 1 Subscript character . . . . . Ctrl F8 1 2 Underline . . . . . F8 Delete an effect--See Using Format Codes	Create a header/footer . . . . . Shift F8 2 Number page in header/footer . . . . . Ctrl B End header/footer . . . . . F7 Create a footnote/endnote . . . . . Ctrl F7 End footnote/endnote . . . . . F7 Script or news columns . . . . . Alt F7 Draw with cursor . . . . . Ctrl F3 2 Insert graphics figure . . . . . Alt F9	Define macro . . . . . Name macro . . . . . or 1-8 Name temp macro . . . . . End macro . . . . . Execute macro . . . . . or A	
CTRL = C ALT = A SHIFT = S UNSHIFT = U	F1 Go to DOS/Shell F2 Spell Check F3 Screen Options F4 Move/Copy C Thesaurus A Replace S Reveal Codes U Cancel/Undelete Search Backward Search Forward Switch Doc. Help Block Options Indent L/R Indent Left	F5 Text In/Out F6 Align Tab F7 Footnote F8 Font C Marking Options A Flush Right S Center Text U List Files Bold Format Underline	F9 Merge/Sort F10 Graphics F11 Merge Codes Merge Field Merge Field	F10 Define Macro F11 Start Macro Retrieve Save Reveal Codes	

### FORMATTING PAGES SETTING PAGE FORMAT

#### GUIDELINES

- Use page format settings to indicate the size and type of paper and to change the size of the top and bottom margins.
- When you change a page format setting, you insert a code in a document at the cursor position. You change the page format of a document from the cursor position to the end of the document or to the next page format setting.
- View or delete page format codes on the screen (see USING WORDPERFECT CODES section).
- When you specify the paper size and width of margins, WordPerfect automatically determines the amount of text on each

page. If you specify page numbering, headers, or footers for a document, WordPerfect will print them within the top or bottom margins and adjust the amount of text on each page.

#### SPECIFY PAPER SIZE

(DEFAULT = 8.5 in. by 11 in.)

- Position cursor at top of page where new paper size will begin
- Hold down **SHIFT** and press **F8** (Format)
- Press **2** (Page Format)
- Press **8** (Paper Size)
- When size options appear:
  - To select a listed paper size, press the appropriate number, or
  - Enter a different paper size. WordPerfect uses this size to reformat your document and find the appropriate form in the selected printer's definition to match the paper size.

a. Press **0** (letter o (Other))

#### SPECIFY PAPER TYPE

(DEFAULT = Standard)

Use this procedure to select a paper type that indicates a change in any of the following: orientation, initial presence (must type G (Go) from Printer Control screen to begin printing), sheet feeder bin/manual feed/continuous feed, and page offsets. Paper type changes are useful when you need to change sheet feeder bins or page offsets.

- At Paper Type menu, select a paper type. WordPerfect uses this type to find an appropriate form (in the selected printer definition) that contains necessary bin, paper feeding method, page offset, and font orientation instructions.
- To select a listed type, press the appropriate number.

#### NOTES:

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# EMAIL GOES QUICK-MAIL

**A**FTER AN EXHAUSTIVE evaluation, one of the world's largest accounting firms, Peat Marwick Hungerford, selected QuickMail to run inter-office electronic mail (email) networks for their Audit and Management Consulting divisions in Sydney and Canberra. The job of evaluating the contenders, QuickMail, InBox and MS Mail, was given to an in-house Canberra-based project team with experience in local area networking and connectivity.

Nick Evered, head of the team, commented that 'We had to sweat our sox off to get through the job of accessing all the

For it to be effective, the choice of an electronic mail system needs to be carefully considered . . .

competing solutions, both hardware and software, to find a package with the inherent flexibility to provide solutions for work groups, field auditors and our inter- and intra- state offices.

'Despite the claims of vendors, only QuickMail had the features needed to satisfy Peat Marwick Hungerford's email network and was found to be the best match for the corporation's needs.'

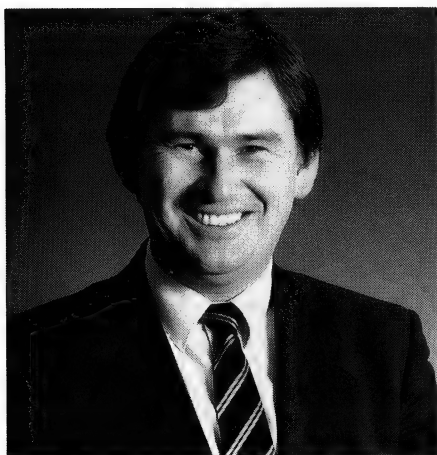
As well as looking at the features and specifications of email packages, the project team also had to evaluate the dynamics of information flow in both the Sydney and Canberra offices, to see how well email software could emulate existing communication channels.

'We were using a sand-shoe net: loading files onto floppy disks and hand-delivering them to the boss. This meant a lot of



*A high workstation population and multiple sites indicate a business should consider implementing an electronic mail system.*





*Email became a proposition for Peat Marwick because we have two Macs for every three professional staff in our audit and management consulting areas. The high work station population, in excess of 300 Apple Macintosh and MS-Dos PCs, made this a perfect email environment and meant implementing it wasn't such a drastic move – Nick Evered, evaluation team leader at Peat Marwick.*

important information was lying around on floppy disks in top draws and in people's pockets, where it can be difficult to find,' Evered noted.

The project team found email had many benefits over this and older communications technologies. It simplified sharing data files between work groups, providing access to audit data and created new ways of using networks. Evered: 'Field auditors visiting clients input data into their Macintoshes. They either dial-in this data or bring it back to the office, where it is up-loaded to a Wang VS host. A KPMG audit tool called 2190 is then used to process the audit data. Junior staff then prepare reports, which are reviewed by managers and then put to a partner.'

## Evaluation

HAVING DEFINED information flow as the basic requirement of any system selected, the project team then decided the email package chosen would have to resolve other basic needs –

- 1) Sharing peripherals,
- 2) Sharing information,
- 3) Connectivity with the Wang VS host,
- 4) Integrate electronic mail across the LAN and the Wang network,
- 5) Integrate electronic mail with the firm's international use of Keylink, and

- 6) Controlled remote access for professional staff located at clients' premises.

Besides these immutable criteria, Evered said the project team had several less rigid demands on their wish list: 'Obviously, ease of use was important. Our job is to provide productivity tools for professional staff who don't need to understand how the technology works, they just need to know how to use it.

'We have also developed a great many Excel models other staff want to use as templates. We wanted a means of sharing these around. As well, we wanted expandability so other divisions within the firm can be progressively incorporated into the email network.'

QuickMail operates on a variety of levels: sending and receiving messages from users within the local network; contacting dial-in users who can link into the email system with a modem; communicating with other networks (local or remote); and linking via a 'software bridge' with other Australian electronic mailing systems such as KeylinkT, KeylinkD, and MayneMail.

Other QuickMail features that appealed to the team included the ability of the system to hold messages until the users returns to the terminal, broadcast messages to everyone on the network at once, and to organise conferences. Because QuickMail supports binary file transfers, it can also be used to send spreadsheet models and templates to anyone on the network, overcoming a particular communication problem of the 'sand-shoe net' defined by the project team.

QuickMail also has software bridges and gateways which provide the link between offices in Sydney and Canberra and internationally with Keylink, so sending electronic mail from one city to any other is as easy as sending a message to the next desk. □

## Product Details

**Product:** QuickMail  
**Distributor:** Keyway Computers  
 2 Beauchamp Rd,  
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 Phn: (02) 316 6599; Fax: (02) 316 6875  
 Price: \$595 for 10 users  
 Only QuickMail had the features needed to satisfy Peat Marwick Hungerford's email network and was found to be the best match for the corporation's needs.

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# BACK UP THE FUTURE!



**T**HE SEVENTH Annual Australian Computers in Education Conference was all that it set out to be – informative, entertaining, provocative and inspiring. Conferences of this nature provide a marvelous ground for exchange of ideas, a chance to mingle with counterparts from other states (be they teachers, administrators or software/hardware suppliers) and the opportunity to listen to keynote speakers – both local and international.

Held in Canberra at the new National Convention Centre late last year, it was the first national conference in the eastern states for three years, and promised to be the biggest ever. However, due to the pilots' strike, numbers were a bit down and the itinerary became a little confused, but conference organisers soldiered on. What they provided in the way of venue, guest speakers and the diversity of paper and poster sessions was truly remarkable. At any one session, delegates could choose from one of twelve presentations, some of which were published in the con-

## Reporting on the Seventh Annual Australian Computers in Education Conference, Sharon France found that now is the time for consolidation . . .

ference proceedings, or they could converge on the exhibition area where software and hardware companies demonstrated their wares. The conference was also graced with a display from the Young Victorians Quilt Exhibition which ably demonstrates the linking of the traditional craft of quilt making and 'state of the art' technology.

The theme, Back up the Future, seemed to be generally accepted as appropriate – many teachers and administrators agreeing now is the time for consolidation. The

beginning of the '80s saw the dynamic evolution of computer technology and the grand entrance of computers onto the education scene. Computers were hurriedly incorporated into schools and curriculum written around them. The technology has not stood still, and while a sector of the teaching profession and educationalists have become more comfortable and conversant with computers and their software, it is felt that we need to take stock of what has gone before to plan for the future – to build on sound practices and preserve the best features of classroom computing as they have evolved so far.

### Keynotes

THE CONFERENCE organisers drew on local and international talent to deliver the keynote addresses. Dr Betty Collis, Associate Professor of the Department of Education at the University of Twente, Holland, shared her experiences of computers and their educational applications across the globe. It seems that in-servic-



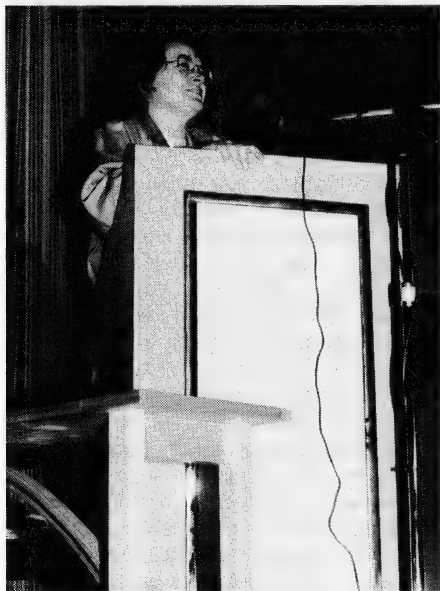
ing is a global problem for teachers, as is getting more and more teachers motivated and committed, to keep the technology alive and thriving. Overall, she was most complimentary of the Australian scene, citing the efforts Miller Computer Education Centre and the development of software and programs as exemplary.

Dr Barry Newell, author of *Turtle Confusion* (and other publications) and Administrator of the Mount Stromlo and Siding Springs Observatories, challenged delegates by posing the problem of the crowded curriculum. How can computing be introduced by teachers into a classroom where their time is already stretched to the limit?

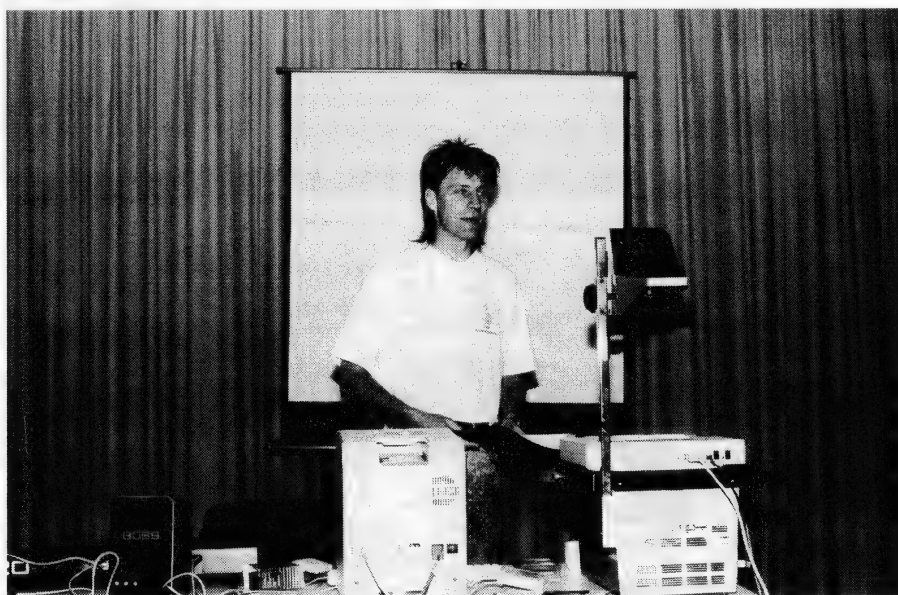
Anita Straker, senior advisor for In-Service Education with Berkshire LEA in the UK, discussed the development and introduction of a National Curriculum for Information Technology in the UK. Despite initial opposition (two years ago, three-quarters of all teachers were against the idea. However, the latest Gallup poll shows that three quarters are now in favor), the National Curriculum has provided assessable and concrete goals for students and



*Dr Barry Newell, Administrator of the Mt Stromlo Observatory, suggested that 'school curricula appear crowded because we believe that human knowledge is composed of a number of separate subjects. We fail to take advantage of the considerable overlap between such areas and the way that representational models of each 'area' mesh together to build coherent mental models.'*



*Dr Betty Collis of the University of Twente, Holland, touched on a number of issues at the Conference that Australian teachers share with many other educationalists – the importance of the teacher, the fact that there are no easy answers, and the difficulty of synthesising all of the information available to us and the problems with communicating ideas and findings, not only nationally, but internationally.*



*Computer musician Billy Nielson provided the entertainment feature at the conference dinner. Volunteers from the audience had their voices digitally sampled and heard them manipulated and played back in 'interesting' pitches and speeds.*

teachers – including the use of spreadsheets, databases and problem solving through simple programming. There are many problems to overcome (hardware shortages, support for teachers and as-

essment techniques) but, according to Straker, 'We have made a start'.

If not challenged enough by the ideas presented by the keynote speakers, delegates were also treated to considerable



## 1990 Conference in focus

THE FIFTH WORLD Conference on Computers and Education is but months away and organisers are hard at work promoting the event. All aspects of educational computing will be represented, ranging across primary, secondary, tertiary, industry, and community education. It will provide an opportunity for people from many countries and backgrounds to meet and exchange ideas and experiences.

Planning is well advanced at this stage with six major streams providing the focus for the conference. These include Advanced Curriculum Projects in Information Processing, Research on Educational Applications of Information Technologies, and Vocational Education and Training.

All of these streams are chaired and represented by overseas specialists from Denmark, USA, UK, Israel and Hungary.

Mini-conferences also form a focus for the conference. Included in the line-up are Teleteaching, and Kids and Classrooms. The Teleteaching component will address the topic of educational technology for distance learning and will include papers, invited speakers, discussion panels and demonstrations. It will be chaired by Gordon Davies from the UK.

Kids and Classrooms will be chaired by Pam Gibbons, who is currently a lec-

turer in Computer Education at the Catholic College of Education in Sydney. Pam has devised an exciting series of sessions involving children and computers. Delegates from Australia and overseas will be able to be 'flies on the wall' and watch local teachers conduct exemplary classes with local students, incorporating computer technology. Overseas student delegates will also be encouraged to participate in 'hands-on' sessions where they will have the opportunity to work with computers alongside leading local teachers.

With the major conference in Australia and pre- and post-conferences in New Zealand and Japan, respectively, 1990 very much focuses on the Pacific for computers and education.

For locals - teachers, parents, educationalists or those with an insatiable urge to find out about the local and international computers in education scene, this conference is a must. It will be held at Sydney's Darling Harbour from July 9 to 13, 1990. Five days out of your busy schedule will be well rewarded. Attend the conference and show your commitment to our children's future and the technology that is helping us advance into the '90s.

For more details about the conference, and indeed for registration forms, contact WCCE/90, PO Box 319, Darlinghurst NSW 2010.

wit and passion in Tom Snyder's anecdote address, beamed directly to the Convention Centre from Boston, USA, compliments of OTC. Snyder is perhaps best known to Australian teachers for his popular packages which include Snooper Troops, The Other Side, Decisions Decisions, Geoworld and Timeliner.

Snyder noted that his company's catalog carried the slogan: 'Software for teachers who love to teach'. He advocates that computers and software cannot make bad teachers good, nor can it replace them. 'But, computers can help teachers to feel more professional, and I think that's a good start.' Although this concept has been posed before by educationalists in all parts of the world, in the context of the National Conference, from one so obviously committed to teaching, it made an impact with many delegates and gave them fuel for their battle to keep going and inspire others.

### Video conferencing

OTHER CONFERENCE treats included an amazing music and video show staged by Billy and Narelle Nielson, as the entertainment feature for the conference dinner. Billy used Macintoshes extensively in the preparation and presentation of this spectacular. An interesting innovation was to watch selected 'volunteers' from the audience give voice samplings which were then manipulated and played back at various pitches and speeds.

The conference also provided the platform from which to publicly launch a number of hardware and software productions. Amongst these were Microbee's 640TC Plus machine, Dataflow's Where in Time is Carmen San Diego, Chandler Software's Fund Accounting modules, and a publication by the Curriculum Development Centre - *Computers in the History Classroom*.

The National Computers in Education conference provided another great opportunity for the sharing of ideas between concerned individuals. Delegates undoubtedly left the conference with many questions generated by the keynote speakers' addresses and practical ideas gleaned from the poster and paper sessions. It's organisation and planning are a credit to those responsible. As the last National Conference before Australia plays host to the World Conference in Darling Harbour later this year, it has given many food for thought about the direction of computers in education in Australia, and hopefully, an impetus to participate in the conference next year. □





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# ASSEMBLING QUICKBASIC

## Part 10

**B**Y WRITING ASSEMBLY language call routines, it is possible to construct QuickBasic programs that exercise much greater control over the operation of the PC than would normally be possible with Basic. When this sort of machine control is exercised, the programmer has a responsibility to ensure that the operation of the PC is returned to normal when the QuickBasic program terminates. While this is easy enough if the program terminates normally, it is far from easy when the user exits the program illegally. If the QuickBasic program has been altering fundamental characteristics of the operation of the machine, the user may be forced to re-boot in order to get everything working again.

For one type of routine this ability to restore things to normal is critically important – these are routines that alter the interrupt vector tables. These tables store the addresses of routines that are executed when a particular event occurs. In order to use these tables, the address of the routine to be executed is written into the appropriate location, but when the QuickBasic program has terminated, the routine is no longer in memory. Should the interrupt event occur at this moment, then there is no routine to be executed, and the machine will either start executing the wrong piece of code, or simply lock up.

To ensure that modifications to the interrupt vector tables are restored to standard before the program is removed from memory, QuickBasic provides a facility that will force a particular routine to be run whenever the program terminates. By advising QuickBasic of the location of this 'clean-up' procedure, it is possible to ensure that it will be run regardless of the manner in which the program terminates.

This is achieved by having the user-written assembly language routine make a call to a supplied procedure called B\_ONEXIT.

This month, Jeff Richards looks at machine language subroutines which are useful for controlling critical functions that cannot be easily or reliably handled from higher-level languages.

If the address of a user-written routine is passed to B\_ONEXIT, then the routine will be executed whenever the program terminates. Up to 32 routines can be set up in this way. If the program is running in the environment, then the routine will be executed when QuickBasic finishes – if it is running stand-alone then it will be executed immediately before the program returns to Dos.

The routine in Listing 1 can control the use of the print screen feature because it is invoked through an interrupt – pressing Shift/PrtScr is an 'event' that triggers an interrupt: interrupt number 5 to be precise. By writing the address of our own routine into position 5 of the interrupt vector table, we can ensure that the print screen function is not executed. But we must also ensure that the original print screen routine is restored when the program finishes.

### Routines

THE REQUIRED CODE consists of 4 routines, of which two (or possibly three) are called from the QuickBasic program. The first one, called Install, does three things. Firstly, it uses a Dos service to obtain the address of the current print screen routine (which is carefully saved away). Secondly, it uses a similar Dos service to install our routine as the print screen routine. Thirdly, it advises QuickBasic of the address of the 'clean-up' routine that must be executed when the program finishes. Install will be called as a Function at the start of

```
TITLE NOPRTSCR - QuickBASIC Library Routine
DOSSEG
.MODEL MEDIUM

.DATA
IntAddr Label    WORD    ;Original Print Screen Routine
          DW      0       ; Offset
          DW      0       ; Segment

.CODE
EXTRN  B_OnExit:PROC    ;This procedure is defined
elsewhere.
PUBLIC Install, Prt1st, Remove
```



```

PFlag DW 0 ;Print Request Flag

Install PROC
    Mov AL,5 ; Interrupt # to re-direct.
    Mov AH,35h ; Get current Vector
    Int 21h ; from DOS.
    Mov IntAddr,BX ;Save the offset
    Mov IntAddr+2,ES ; and the segment
    Mov DX,OFFSET PrtScr ;Address of the new routine
    Push DS ;Save our data segment
    Push CS ;Copy our code segment
    Pop DS ; into DS.
    Mov AL,5 ;For interrupt 5 -
    Mov AH,25h ;Ask DOS to do it.
    Int 21h
    Pop DS ;Retrieve our data segment
    Push CS ;Push our Code Segment
    Mov AX,OFFSET Remove ; and the offset address
    Push AX ; for B_OnExit,
    Call B_OnExit ; and advise QuickBASIC.
    Ret ;All done.
Install ENDP

PrtScr PROC ;Interrupt Service Routine.
    Mov CS:PFlag,-1 ;Set Print Request Flag
    IRet ; and return from
interrupt.
PrtScr ENDP

PrtTst PROC
    Mov AX,CS:PFlag ;Get Print Request Flag
    Mov CS:PFlag,0 ; and clear it.
    Ret
PrtTst ENDP

Remove PROC
    Push DS ;Save our DS.
    Mov DX,IntAddr ;Get old vector offset
    Mov DS,IntAddr+2 ; and segment
    Mov AL,5 ; for interrupt 5.
    Mov AH,25h ;Ask DOS to
    Int 21h ; re-install it.
    Pop DS ;Retrieve our DS
    Ret ; and back to BASIC.
Remove ENDP
END

```

**Listing 1.** The routine *Noprtsr* involves a procedure to prevent the user from accessing the print screen function while the program is running. While there are a number of different ways to do this, the well-behaved program will ensure that the full functionality of the print screen facility is restored when the program terminates.

the program, or as soon as we want to disable the Shift/PrtScr key. If it returns zero, then QuickBasic was unable to store the address of the routine, and the program should not continue.

The second routine is called *Prtscr*. It is the address of this routine that is inserted into the interrupt vector table at position 5. This routine will be executed each time the user presses Shift/PrtScr – it would not be called from the QuickBasic program. Here, this routine just sets a flag that can be tested later.

The third routine (*Prttst*) is a function that tests the flag and clears it. This could be called from the program, in order to see if the user had attempted to use Shift-/PrtScr. If we didn't care whether or not the user had pressed Shift/PrtScr, then there would be no need to call it.

---

*To ensure that modifications to the interrupt vector tables are restored to standard before the program is removed from memory, QuickBasic provides a facility that will force a particular routine to be run whenever the program terminates.*

---

The fourth routine is executed when the program finishes. It is the address of this routine that has been passed to QuickBasic by the *Install* procedure. As a result, QuickBasic is aware that when the program terminates, and before passing control back to Dos, this routine must be executed. It uses the Dos function to re-install the address of the original interrupt service routine (which was carefully saved by the *Install* procedure) into the interrupt vector table at location 5.

It is possible to call this routine from the program. In Listing 1, the routine could be called any number of times – in each case it would re-install the correct interrupt service routine without consider-



ing whether or not it had already been done. If it was important that the 'clean-up' routine is only performed once, then the code must be included to check whether or not it had already been called.

It is also important that the Remove procedure is not called before Install has been executed, as there will be no saved interrupt address to re-install. If the label Remove is taken out of the list of Public symbols, then it cannot be accidentally called from the QuickBasic program, but could only be run as a result of QuickBasic executing the B\_ONEXIT routine, in which case Install must have been previously executed. Alternatively, Install could set a flag that Remove could check.

```
DEFINT A-Z
DECLARE FUNCTION Install% ()
DECLARE FUNCTION PrtTst% ()
IF Install% = 0 THEN STOP

DO UNTIL Forever
  F = PrtTst%
  IF F THEN PRINT "Request Denied!"
  IF INKEY$ = CHR$(27) THEN SYSTEM
LOOP
```

**Listing 2.** A demonstration of Interrupt Trapping – firstly, Install is called; if it returns zero the installation was not successful and the program does not proceed; if it was successful, then the normal print-screen function has been replaced with the custom-written one.

Listing 2 is a program that demonstrates the use of the procedures. It then simply tests the print screen flag to detect whether the user attempted to use the print screen function. If an attempt is detected, the message 'Request Denied!' is displayed. If the user ends the program with Escape, then control is returned to Dos. Because QuickBasic has been instructed to run the Remove routine before terminating, the user will find his print screen function has been fully restored.

Note that the flag used by the interrupt service routine is stored in the code segment. These interrupt service routines can become complex if they are forced to save and restore segment registers, so it is simpler to put everything in the code segment rather than trying to discover and load the correct data segment. Interrupt service routines deserve a whole chapter on their

own, but the example Listing 2 will serve for simple applications.

## Assembly languages

MANY ASSEMBLY LANGUAGE routines for QuickBasic are written to be completely stand-alone. They either perform a task such as a BIOS or Dos call, or manipulate some data and return the new value. There are circumstances, however, when it would be useful if the user-routine could make use of facilities that already exist within the QuickBasic compiler.

There are a number of possible reasons for attempting to use facilities internal to QuickBasic. One is that the internal routine may perform a repetitive or complex task, and using the inbuilt procedure makes the user-routine simpler, saving programming effort and helping to create smaller programs. The other is that the routines may extract from QuickBasic certain internal information that they need for the task, or they might update information internal to QuickBasic. Listing 3 falls into the second category.

## *The flag used by the interrupt service routine is stored in the code segment.*

Before proceeding with routines that access QuickBasic internal procedures, a word of warning is necessary. Because QuickBasic procedures are completely undocumented, there is no guarantee that the routines will work in the same way, or will even exist, in different revisions of the compiler. Any routines that access internal procedures should be assumed to be usable only on revisions of the compiler with which they have been tested. They should not be moved to new revisions without re-testing. One way to avoid possible compatibility problems is to always compile to stand-alone .EXE files rather than to files that require the run-time support module.

It is also worth commenting on just how it is that user written assembly language routines can access internal QuickBasic procedures. The explanation comes from the manner in which the compiler is put together. The compiler's job is to translate each part of the program into ma-

chine language. Often the compiler will construct a series of assembly-language instructions that perform the required task. More frequently however, the compiler creates codes that do a little bit of housekeeping, and then issues a call to a standard routine. Because the compiler writers built their compiler from a series of separate modules, the call to the standard routine is a call by name to a routine in an external library. When the linker (or the QuickBasic environment) builds the program out of the compiler-created code and the standard library, the required modules are linked in. At this point, the linker cannot tell (and doesn't care) whether the call to the routine comes from compiler-generated code, or from code in a user-routine. In each case, the required module will be linked into the executing program.

Therefore, user-written routines can access QuickBasic internal procedures in exactly the same way the compiler-gener-

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ated code does, that is, simply by setting up the appropriate parameters and issuing a call to the named procedure. Parameters are established by pushing data onto the stack, and the procedure can be called correctly by labeling it as Extrn and then using a simple Call statement.

Listing 3 is designed to replace a common bit of repetitive coding that appears in many QuickBasic programs. It arises when the program temporarily interrupts what it is doing to perform a brief, stand-alone procedure, before returning to the point at which it was interrupted. An example might be where the user has requested help, and a help screen is displayed. To correctly resume processing, it is necessary that the current cursor position is saved, and then restored when the interrupting procedure finishes. This is how the job would usually be coded –

```
R = CSRLIN : C = POS(0)
HelpScreen
LOCATE R, C
```

– two variables are used to save the cursor row and column, and then the Locate statement returns the cursor to its original position.

The two routines presented here simplify the cursor saving/restoring sequence. The first, CsrSave, will simply store the current cursor row and column in memory. The second retrieves the stored values and resets the QuickBasic cursor to the old location.

## CsrSave

CSRSAVE WILL USE the internal procedures B\$FPOS and B\$CSRL to get the cursor column and row respectively. B\$FPOS requires one parameter on the stack, while B\$CSRL needs none. The returned values, in the AX register, are simply saved to the designated storage locations, ready for a CsrRest.

The cursor restore function is a little more complex. It will use the QuickBasic procedure B\$LOCT, which is the same procedure used by the Locate statement, and will perform exactly the same task as the Locate R, C statement in above example. However, QuickBasic allows considerable flexibility in the arguments passed to the Locate statement, and the calling protocol for B\$LOCT reflects this.

Firstly, parameters to the Locate statement can be left out, and default values will be supplied. Thus, before each pa-

```
TITLE CURSOR QuickBasic & Library
Routines

.MODEL MEDIUM
DOSSEG

.CODE
PUBLIC CsrSave, CsrRest
EXTRN B$FPOS:PROC, B$CSRL:PROC,
      B$LOCT:PROC

CsrSave PROC
    Push    bp
    Xor     ax,ax    ;Clear AX
    Push    ax
    Call    B$FPOS    ; and call POS().

    Mov     CCol,ax ;Save the result.
    Call    B$CSRL    ;Call CSRLIN.
    Mov     CRow,ax ;Save the result
    Pop     bp
    Ret     ; and finish.

CsrSave    ENDP

CsrRest    PROC
    Push    bp
    Mov     ax,1    ;Push a 1
    Push    ax
    Mov     ax,CRow ; and the row
    Push    ax
    Mov     ax,1    ; and another 1
    Push    ax
    Mov     ax,CCol ; and the column
    Push    ax
    Mov     ax,4    ;(there are 4
                    ;arguments)
    Push    ax
    Call    B$LOCT    ;Call LOCATE
    Pop     bp
    Ret

CsrRest    ENDP

.DATA
CCol DW 1 ;Default is top left
      corner
CRow DW 1

END
```

**Listing 3.** Two routines to simplify the cursor saving/restoring sequence. The first, CsrSave, will simply store the current cursor row and column in memory. The second retrieves the stored values and resets the QuickBasic cursor to the old location.

rameter is passed to B\$LOCT, it's preceded with a flag to indicate whether the parameter was supplied by the user or whether the default should be used. We are supplying both the parameters we need, so the flag value to be pushed onto the stack, and ahead of each parameter is '1'.

Secondly, the Locate statement can take a variable number of parameters. To avoid having the compiler supply dummy parameters to fill in for any that are not supplied by the user, B\$LOCT accepts a parameter-count argument. This is '4' in our case (two arguments and two flags) so this value is pushed onto the stack immediately before calling B\$LOCT.

The procedure names, the required arguments, and the way they are pushed onto the stack, represent the 'definition' of the internal procedure. It is this definition that may change with any new revision of QuickBasic, so this particular procedure cannot be guaranteed for anything other than revision 4.5.

*QuickBasic provides a facility that will force a particular routine to be run whenever the program terminates.*

Notice that the storage allocated for the row and column values is initialised to '1'. This ensures that if the restore procedure is called before the first save, then the cursor will be restored to the top left corner of the screen. Multiple restores without intermediate saves will restore the cursor to the last saved position. The routine could be modified to refuse to restore a cursor that had not been correctly saved – for instance by setting the value to -1 after a restore, and then refusing to restore if it detected a stored value of -1.

This implementation of the routine to save and restore the cursor is somewhat simplistic. A full routine would establish a storage area implemented as a 'stack', so that nested save/restore procedure calls could be made, with each restore retrieving the data saved with the most recent save. That additional functionality would turn an interesting example into a very useful tool. □





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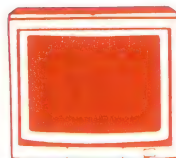
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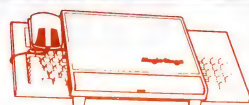
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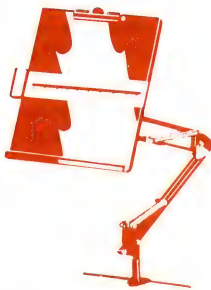
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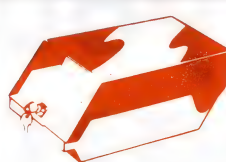


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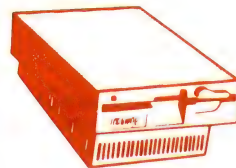


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# FRAM

## A RAM THAT DOESN'T FORGET!

**Y**OU'RE TYPING AWAY furiously on your latest masterpiece – the last chapter of your soon-to-be best-selling novel. Your fingers are having a hard time keeping up with the flow of ideas through your head. Suddenly the light goes out, and there's the sickening sound of the fan and hard disk in the computer slowly grinding to a halt. Perhaps running the computer, air conditioner, microwave oven and electric kettle on the same circuit was not such a good idea after all?

You trudge out to the fuse box and replace the fuse, and return to your trusty computer, to see the screen exactly as it was before the power failed, complete with the cursor waiting patiently where you left it in the file. Of course, you had expected the information to still be there, because the memory chips in the computer are new FRAMs, rather than DRAMs.

Science Fiction? Well, yes it is, but FRAMs already exist in the prototype stage. FRAM stands for Ferro-Electric Random Access Memory, and is an area of semiconductor research which promises to revolutionise many computer memory applications.

An Australian-based company, Ramtron Australia, is one of the leading researchers in ferro-electric Ram technology, although all of Ramtron's research takes place in its Colorado Springs plant in the US.

The ferro-electric effect is similar in nature to ferro-magnetism, the property which allows permanent magnets to do their stuff, although the causes of these two effects are entirely different. In fact, FRAM makes no use of iron or any other ferrous metal – the ferro-electric effect takes place in certain ceramic materials known as Perovskites (the same family of materials which are exciting scientists at the moment in the field of high-temperature superconductivity).

The active element in an FRAM cell is a ferro-electric capacitor, which is like an ordinary capacitor, with two metallic plates separated by a piece of dielectric (insulating) material. However, in a ferro-electric capacitor, the dielectric is made from a Perovskite material, which is a molecule containing lead, zirconium and titanium (known as PZT for short).

Australian-based Ramtron is involved in research which promises to revolutionise computer memory . . .

When the ferro-electric capacitors are charged up electrically, the PZT material is polarised in the direction of the electric field. However, when the electric field is removed, this polarisation remains, in the same way as a screwdriver retains some residual magnetism when passed over a magnet – hence the parallel between the two effects discussed above. The direction of this polarisation can then be sensed during a read cycle, and decoded into a binary one or zero.

Aside from the obvious applications in computers, Ramtron sees FRAM as having

uses in other areas, not strictly related to computers. For example, in the automotive field, applications such as storage for an electronic odometer, where data retention is of vital importance, storing preset stations in car radios (and hi-fi tuners, for that matter), or as the number memory for a cellular phone. All of these areas need a memory device which will not forget everything whenever the car battery is disconnected (or somebody leaves the headlights on all day).

They are also useful for applications such as engine ignition control and active suspension control. In these types of uses, the ease with which the memory can be re-programmed means that the system can be tuned for the user's particular application. For example, the timing of the engine can be optimised for economy or power, depending on the driver's preference. Other uses could include memories for digital power consumption meters in domestic and industrial applications.

These uses only require low-capacity devices, as the amount of information which needs to be stored is relatively small. For FRAMs to take over from DRAMs in computers, much higher densities will be required – on a par with current and future DRAM technology. However, before FRAMs can even begin to compete with current memory technologies, there is one important problem which needs to be solved first.

FRAMs have a limited lifetime, currently in the order of  $10^{14}$  cycles. However, it is expected that an increase of at least an order of magnitude (10 times) will be achieved in the very near future, and indefinite lifetimes within nine months. Even with current technology, the lifetime of FRAMs far exceeds that of other non-volatile alternatives such as EEPROM by many orders of magnitude.

Current devices have an access cycle time of 200 nanoseconds (ns), but when the range of high-density devices for main memory applications become available, they are expected to have cycle times of 50ns or less.

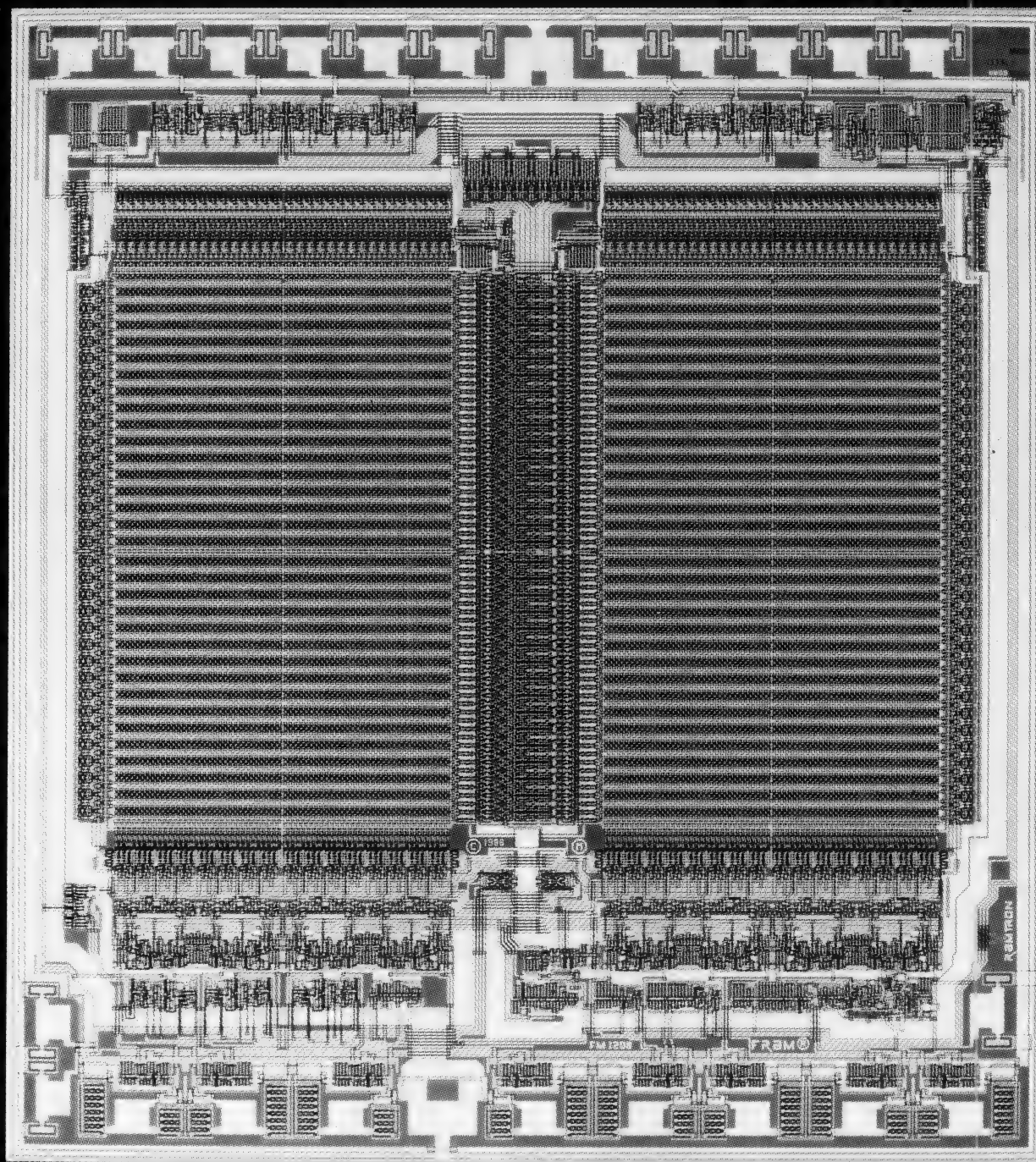
### Current technology

IN THE EARLY days of computing, there was only one type of memory – magnetic



*Ross Lyndon-James, deputy chairman of Ramtron Australia, expects FRAMs to be able to compete with DRAMs within a year. But the company isn't putting all its chips in the FRAM basket – it has recently announced what is claimed to be the world's fastest DRAM, with an access time of 50ns.*





*Ramtron's first commercial FRAM chip – a 4K-bit device. Although this chip has a limited life (in the order of  $10^{14}$  cycles), the company expects to achieve an 'indefinite lifetime' within nine months.*

core memory. It was not silicon-based, like modern memories, but consisted of lots of little ferrite rings supported on a grid of wires. The polarisation of the magnetic

flux in each of these beads represented the value of a particular bit in memory. Of course, core memory has been obsolete for many years now, replaced by much

more compact silicon memory devices.

Of these, the most useful is RAM – random access memory. Strictly, all semiconductor memory is random access (except,



perhaps, for bubble memory (which popped as quickly as it appeared), but RAM describes a special type of memory which is easily readable and writeable.

The two main types of RAM in common use today are SRAM and DRAM (Static and Dynamic RAM, respectively). Of these, DRAM is the simplest in structure, and thus has a higher density in terms of bytes per chip, and is also cheaper, and it follows that DRAM is by far the most popular.

The problem with DRAM is that it needs to be refreshed quite often, otherwise the data stored in it will eventually be lost. DRAM stores the data in small internal capacitors, which are electronic components which store electric charge. However, this charge storage is not perfect, and the charge gradually leaks away. For this reason, DRAM needs to have the charge in each of its internal capacitors 'topped-up' every so often. This so-called refresh cycle is performed by cycling the address lines periodically, and this causes a slight decrease in overall speed, known as the 'refresh overhead'. This is usually specified as a percentage, representing the proportion of time in which the RAM is being refreshed, when the CPU cannot access the memory.

SRAM, on the other hand, does not have this problem – any data stored in this type of memory will stay there for as long as power is applied to the chip. Each element in SRAM is based around a flip-flop, an electronic building-block which has two stable states, and can be switched between states when required. Because of the added complexity of SRAM over DRAM, the former tends to be more expensive, and one bit of SRAM occupies more chip area than a single DRAM bit, so overall densities obtainable with SRAM are lower than those for DRAM.

SRAM is also faster than the fastest DRAM chips, so it lends itself to applications such as *RAM caching*, where speed is important. Caching is commonly used on fast '386 machines, where the cost of several megabytes of RAM fast enough for the processor would be prohibitive. A cache allows a relatively small amount (usually 32- or 64K) of very fast SRAM to store the most commonly accessed locations in main memory, so that they may be accessed without wait states. When the program calls for data from a memory location which is *not* in the cache, then it is read from main memory, and stored in the cache, in case it is needed again.

Caches can be deceiving when running benchmarks, since the program loops

which are actually used to determine the speed of the computer, may fit entirely in the cache, without any need to access main memory at all. When this happens, the machine performs as if the entire memory map is as fast as the cache! Of course, real world applications aren't that small (you don't see many 64K programs around these days), and so such benchmark results can be a touch optimistic.

## Problems

THE PROBLEM WITH both SRAM and DRAM is that they are volatile – turn the power off and they forget everything they ever knew! Old-style core memories were non-volatile, but they were so big and fragile and power-hungry that nobody in their right mind even contemplates the prospect of using them these days. And then of course, there is FRAM, as discussed earlier, which is still largely in the developmental stage.

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*Despite its apparent complexity, Ramtron claim that there are actually less steps involved in manufacturing FRAMs than for DRAMs.*

---

Since RAM forgets the data stored in it when the power is turned off, there needs to be some form of telling the computer what to do when power is first applied, or the system is reset. In the early days of computers, machines were equipped with a 'front panel' which contained a row of toggle switches and lights. When the machine was powered up, the bootstrap loader was entered into memory via these toggle switches, and it was a matter of pride for such a computer operator to be able to toggle the bootstrap loader without looking at the manual.

Nowadays, the bootstrap usually exists in ROM (read-only memory). This memory is non-volatile, and once programmed during manufacture, its contents cannot be altered or erased. These so-called *mask programmed* ROMs require a large investment on the part of the manufacturer to tool up for a production run, and are eco-

nomical only in large quantities. ROMs, and all their derivatives, have a much slower access time than RAMs, so that very fast computers often copy the contents of the ROM chips into faster RAM when booted up. Then, calls to locations in the ROM chips can be handled much faster than the ROMs could ever manage themselves.

For smaller quantities, a programmable ROM can be used. This is not really the contradiction that it seems at first, since once the PROMs are programmed, they behave exactly as ROMs, unable to be erased nor re-programmed. This compromise allows small production runs to be produced economically, and means that a manufacturer can update software more frequently, since the large tooling cost of mask-programmed ROMs is avoided.

For applications where even more frequent software changes are envisaged, an Erasable PROM (EPROM) can be used. These chips can be erased by exposing the chip to ultra-violet light for about half an hour. The number of times that EPROM can be erased and re-programmed is finite, as memory cells slowly deteriorate with continued exposure to ultra-violet light, usually limiting their lifetime to around 100 programming cycles.

If we add yet another letter onto the front of EPROM, we get EEPROM (electrically erasable PROM). This type of memory also gets around under the aliases of electrically alterable ROM (EAROM), or E<sup>2</sup>PROM. Although its use in PCs is rare, it is commonly used in dumb terminals to store set-up information. The time taken to write data to the EEPROM is much longer than a read cycle, so it cannot be used in lieu of ordinary RAM in most applications. Also, like EPROM, the number of write cycles which can be performed is limited, in this case, the limit is typically between 10 thousand and 1 million cycles.

For data which needs to be maintained without system power, but which changes too often to allow the use of EEPROMS, designers often use a small amount of SRAM to store critical information, with a dry-cell battery to supply the small amount of power required while the system is without mains power.

This sort of application is an obvious place where FRAMs should gain rapid acceptance – with their longer lifetimes than EEPROM, yet without the requirement of a battery. However, until the problem of limited lifetime is solved, the dream of non-volatile main memory will just have to wait a little longer. □



# DRAFT CHOICE

**D**RRAFT CHOICE IS a combination CAD, graphics and drawing program that is particularly useful to draftsmen and other designers. Although at first sight it may not seem to be a candidate for everyone's software library, it is also invaluable for such diverse line or box-drawing tasks as forms design and organisation charts. And, since it can directly read and write Lotus-generated .pic files, you can easily modify the images with text and graphical entries.

Installation is as simple as copying the files from the supplied program disk into a suitable directory. Typing DRAFTC starts the program. There are command line switches to indicate your system's video adapter – CGA, EGA and Hercules standards are supported. Other switches de-select the speeding-up of the cursor and the availability of on-line help. The latter feature makes available an additional 50K of memory for use by the program. Finally, a default text font can be specified at load time – fonts can also be selected from within the program.

## What you need

YOU DO NOT need much more than a basic system to run Draft Choice, only a graphics adapter is essential. However, you will find it more convenient to draw if you have a mouse or graphics tablet. Output devices supported include the Epson FX and LQ2500, as well as the HP LaserJet laser printer and the HP 7470 series of

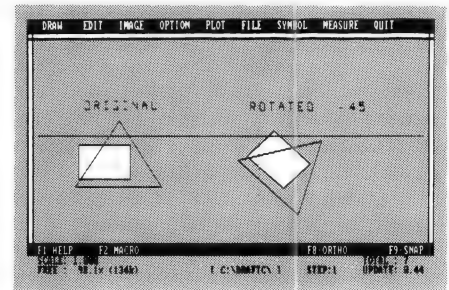
**If you're after a combination CAD, graphics and drawing program, Draft Choice is for you (and for 500 subscribers, it's free)!**

plotters. And, unlike many other CAD programs, a math co-processor chip is not required.

Draft Choice is menu-driven for simplicity, and all commands are arranged logically. Common objects such as lines, boxes, arcs and circles can be drawn with minimum effort, and freehand drawing is also available. The Orthogonal option can be toggled on to ensure that all lines will be drawn perfectly straight. The size, shape and position of objects can be altered using the Edit functions. These include scaling, rotating and mirroring. Scaling lets you draw small objects in detail and then reduce them to the appropriate size in a drawing. Rotating and mirroring are useful when the position of an object needs to be changed quickly. There is even a 'rubber' function that allows objects to be stretched into new shapes.

A host of image commands is provided

to manage both the position of the viewing 'window' and the scale of the displayed drawing. You can toggle between large and small scale views of the same drawing. Another important feature is the ability to load as many as nine drawings simultaneously for an overlaid display. You then select the 'layer' that you wish to work with, and can do so without fear of altering any other layer. Each layer can have a different, user-selectable color to enable easy distinction.

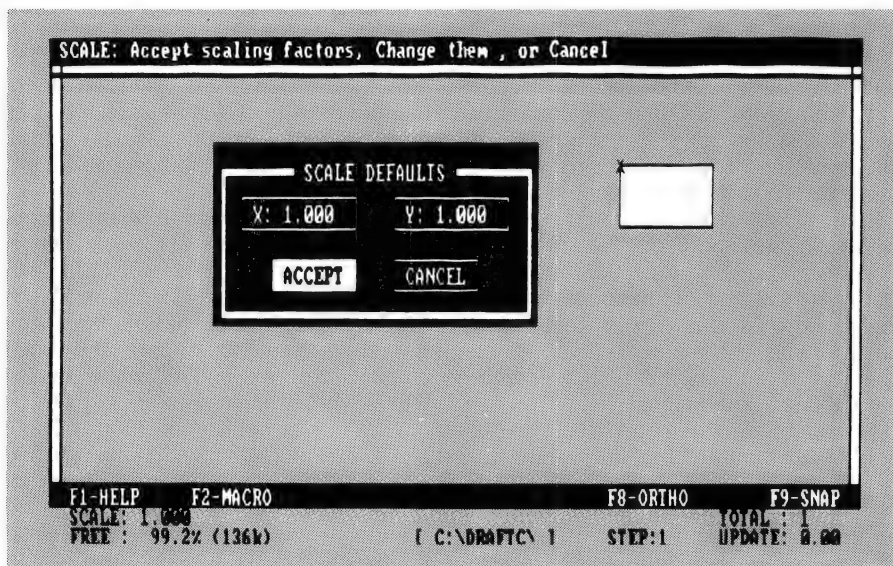


*Elements can be rotated in either direction in degree increments.*

Professional users will appreciate the facility to create symbol libraries. These are collections of specialised objects that you can create and store on disk. They can then be recalled individually for use in any other drawings. Flexibility is provided with four different ways to enter coordinates – absolute, relative, polar and bearing. Coordinates offer an alternative to freehand drawing when precision is required. A formula calculator with exponential, trigonometric and logarithmic functions is also available at the press of a key.

## Other useful features

OTHER USEFUL features include a slideshow capability where images are shown sequentially on the screen either manu-



*In Draft Choice, objects can be scaled along either axis after a reference point is selected.*

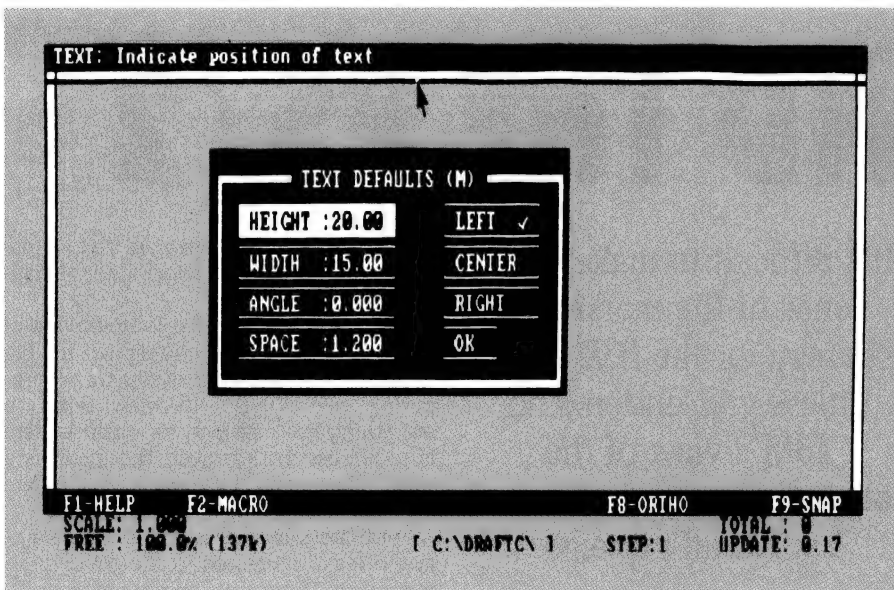
## Product Details

Product: Draft Choice  
Distributor: Manacomm  
PO Box 509  
Kenmore 4069 QLD  
(07) 368 2366  
Price: \$60

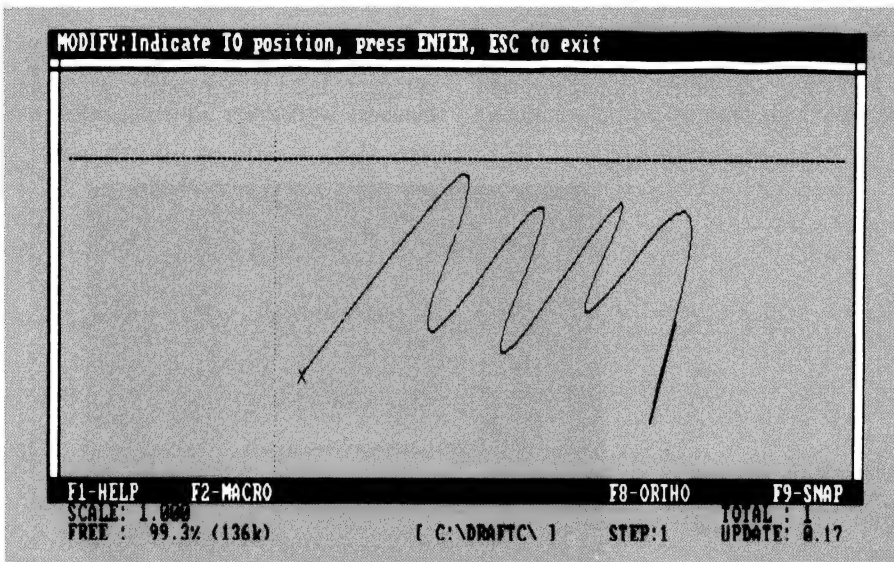
At the price, Draft Choice is more than good value – it's a steal.



## DRAFT CHOICE



Text can be placed anywhere on the screen. Height, width, angle and spacing can be individually set, plus the placement of the text with respect to the cursor can also be specified.



The Modify command allows a number of vertices or control points to be relocated to change the shape of a complex curve – the spline curve shown here was modified by shifting the four peaks to the right.

ally or automatically, and an Undo capability that can restore up to two hundred of your preceding actions! Users can also create keystroke macros by assigning keystroke sequences to a key combination such as Alt-A.

Draft Choice is a solid product with a wealth of features that make it equally useful to beginners and professionals

alike. It is comparable with any mid-level drawing software available – such products usually sell for upwards of two hundred dollars. □

*Our first 500 subscribers in April and May will each receive a complimentary copy of Draft Choice – see page 50 for details.*

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Verbatim DataLife	5.25" DSHD	\$3.30	\$3.10	\$2.90
Verbatim DataLife	3.5" DSDD	\$3.50	\$3.30	\$3.10
Verbatim DataLife	3.5" DSHD	\$7.80	\$7.30	\$7.00
Verbatim DataLifePlus	5.25" DSDD Teflon coated	\$2.90	\$2.70	\$2.50
Verbatim DataLifePlus	5.25" DSHD Teflon coated	\$3.80	\$3.50	\$3.20
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# IBM AND THE PS/2

**T**HE PERSONAL computer, as we know it today, is a creature of Big Blue. IBM created it in its own image and then lost it, to run rampant through the market place. On the best analysis, IBM misjudged horribly. Is IBM repentant? Did they sack the boss? Not at all. When you are as big as IBM, you never have to say you are sorry, you simply re-invent your mistakes. And, when you are as big as IBM, the market adjusts to you – you don't adjust to the market.

Firstly, to recount some well known history, in the beginning was The Garage and the Apple. So the personal computer was born, and a lusty infant it was, too. Within a few short years, it was spreading progeny all over the place. And, few of them could talk to each other. Then Big Blue muscled in on the act, and there was The Standard and MS-Dos.

And, IBM was going to take over the world. That was the intention, and the fear. But in the event, it didn't happen. All those crazy computer people in the hills went broke trying to make their own proprietary architecture. Angst abounded, but then they dusted themselves off and started selling clones. Pretty soon there were more non-IBM IBMs on the marketplace than IBM IBMs, and the price of the genuine article began to look a little silly.

IBM is lots of things. Silly it ain't. One day the men in the dark suits packed up their lunch boxes and went home, but kindly, they left the bat and ball behind – The Standard, and MS-Dos. Whatever the virtues in a technical sense (not many) they created a machine that could be used in the business environment and turned an esoteric hobby into big business.

But soon the men from IBM were back on the street. The PS/2 was here. There was some initial market interest, but the general verdict among the PC pundits was that it was a bastard child and should never see the light of day. And, there was a thing called Micro Channel Architecture that fitted in around the back and was very, very difficult to clone.

Another mistake? No, not at all. The PS/2 was the result of some very clever strategic thinking. In the backrooms at Yorktown Heights, wherever, in fact, there

**It's difficult to make much sense of the marketing strategy for the PS/2 range unless you understand IBM's view of the computing environment, as Jon Fairall explains.**

was a gathering of IBMers, the dread of failure was writ large at all-day meetings. Out of it came a consensus – a new view of what the personal computer should be, where it should fit in to the scheme of things.

And the result? Quietly, in fact *very quietly*, IBM makes more personal computers

in Australia than anyone else. And, charges more for them by an order of magnitude.

The secret? IBM takes a strategic view of the world. Unlike most companies, it's big enough to have a view of the total computing environment. Its view takes in everything from almost the biggest there is to almost the smallest. The result is a view of the personal computer that differs from everyone else's.

For a start, understand that IBM is not in the least interested in the small computer user. There are a number of reasons. Firstly, it makes sense from an economic view. It can be as difficult to sell a \$1000 box as a \$1 million box, so which would you rather sell? And, as a small computer user, which can you afford to buy? There is not much common ground.

At a more profound level, IBM is a big company, and it is therefore happier doing business with other big companies. The

*Although the company sells standalone PCs, IBM's marketing and product development is really directed towards large companies.*





thing about the small computer market is that it changes all the time, with new products and new software coming out of the woodwork. Big companies don't like change. It's impossible to manage.

But most importantly, IBM does not see the small computer as a viable means of delivering services to its users in a business setting. To understand why, it's necessary to come to grips with Systems Application Architecture (SAA) and the 'seamless interface', and to do that, it's necessary to see the big picture.

IBM sells three different types of computers. At the top is the Model 370, a most promethean beast which sits in a basement somewhere under the terminal, is fed by EDP people at odd intervals, and is called 'the mainframe', as in 'the %\$#@ mainframe is down again'.




---

*It's possible to make the network any size you like – think of a single PC as a network with parts missing.*

---

Below this is the AS/400, the world's top selling mid-range device. It will support up to about 500 users, depending on the precise system architecture. (There are other mid-range machines, but they are peripheral to this story).

Finally, there is the PS/2, produced, like the AS/400, in a variety of different shapes and sizes to suit almost every environment.

The 370 runs one of two operating systems – VM or MVS. The AS/400 runs OS/400, and the PS/2 runs either PC-Dos or OS/2. None of these systems will talk to each other. Hence, at the same time as IBM launched the AS/400, it also launched the idea of the seamless interface.

## SAA

THE SEAMLESS interface is only a concept today, but the idea is to develop a constant look and feel to all IBM products through its System Application Architecture (SAA). Think of SAA as a set of rules for producing a screen (interface) for the user that will always look and act the same, no matter what machine the user is running.

---

*IBM's marketing strategy is broad enough to encompass everything from mainframes to portables. The company has introduced the idea of the 'seamless interface' to tie them all into 'solutions' for large corporations.*

---

SAA, in fact, is designed so that it will work with any of the OS/2, OS/400, MVS or VM operating systems. A programmer need only develop one version of his code and it will run on all three machines. By itself, this would not amount to much. However, IBM has a particular view of the system architecture as well. Think of a three-tiered triangular structure, with a 370 at the apex. Below are AS/400s networked together and to the 370. Hanging off the AS/400s are PS/2s, forming the bottom tier. The PS/2s are connected in a LAN, with the AS/400 acting as a file server.

The idea is that the most effective way to use a PC in a business environment is as an intelligent workstation, controlled by an AS/400. This gives the user freedom from network problems, but access to the processing power of the AS/400. In a larger network, it makes the power of the 370 available to the AS/400, and indeed, to the PS/2. In anybody's book, this is real computing power.

Put this together with the idea of seamless interfacing and you begin to see the seductive beauty of the IBM vision.

It's possible to make the network any size you like – think of a single PC as a network with parts missing. Any size network can be supported, depending on need and finance. Because of SAA, all parts of the network will look the same, so that a ter-

minal hanging off a 370 will behave just like a PS/2 running a program on an AS/400.

Even more than the network considerations, IBM planners love the efficiency it is going to give software writers, who will now be able to run programs interchangeably on any IBM machines. In theory, the range of software available will jump dramatically.

---

*IBM was going to take over the world. That was the intention, and the fear.*

---

In fact, IBM is now so hot on its new view that rumors abound of a dedicated intelligent workstation (IWS) based on the PS/2. Think of a PC, without local disc access, but exceedingly capable communications facilities.

It need hardly be said that with the philosophy described here, IBM need not overly concern itself with the antics of clone makers boasting that their machines offer twenty times the performance for one-twentieth the cost. Well, might they say 'so what'? □



# DEFENCE FORCE ACADEMY COMPUTERS

The Australian Defence Force Academy is training their cadets on Macs – William Olson found they wanted more!



**W**E HAVE BEEN AN Apple shop for a long time and had some of the first Macintoshes in Australia,' says Andy Quaine, head of computer science at the ADFA (Australian Defence Force Academy). The ADFA is with the Apple Consortium in Australia, meaning that as an educational institute, they receive special support from Apple.

The Macs at the ADFA have been upgraded to SEs for classroom use. Each classroom Mac has twin floppy drives with

networking to a file server, and most of the academic staff in the computer science faculty have Macs on their desks.

Of the 500 or so new cadets taken in to the ADFA each year, Quaine says more than 70 per cent take some units in computing science in their first year. More than half then go on to second year studies in computer science, with about 80 per cent attempting a major in computer science for their degree.

ADFA cadets are not generally able to follow post graduate studies immediately

because they are committed to military postings. 'However, many people don't realise that we offer post graduate courses, either full or part time up to PhD level, for anyone who has the necessary entry requirements.'

One of the misconceptions about the ADFA is that the academic section of the college is part of the military. In fact, it is a college of the University of NSW with academic staff linked to the main campus in Sydney.

The computer science faculty at the ADFA has been a Unix shop since 1978. There are two networked Pyramid Unix minicomputers – one for research and one for teaching. The minis are 9810 versions with 28Mb of memory and large disk drives. The research Pyramid is linked to 31 staff and post graduate terminals as well as three modems – two modems run at 2400 baud, and the third at 300 baud.

The teaching Pyramid links to three labs of 13 terminals each and has 64 lines on its network altogether.

As well as the two Pyramid minicomputers, there are nine Mac IIs running AUX (Apple Unix version 5).

The faculty offers courses in Unix and C for both undergraduate cadet students and external graduate students. They also offer short Unix courses of two days for administrators. The Mac IIs (with 4Mb of memory plus an 80Mb hard drive) are used by third year cadets as part of their major in computing science, and for research projects, and they are linked to PostScript laser printers. PostScript expert, Bob McKay, formerly with CSIRO, is now part of the ADFA computer science team.

The electrical engineering department at the ADFA also have a lab of about 20 Mac IIs on Appletalk links. These are used for studying remote sensing, as well as for digitising and scanning.

## Pascal interpreter

QUAINE SAYS ANOTHER area where the Macs are used is with the Pascal interpret-



*Of the 500 or so new cadets taken in to the ADFA each year, more than 70 per cent take some units in computing science in their first year. More than half then go on to second year studies in computer science, with about 80 per cent attempting a major in computer science for their degree.*



er. 'The idea here is to get students into programming fairly quickly.' Students continuing in computer science to their second and third years are expected to undertake some project work as part of their course. One example of this is in expert systems where the college uses software called Xi Plus. There is a post graduate continuing research project on expert systems and artificial intelligence involving six academic staff, two PhD students, and a visiting fellow from the CSIRO. The project is aimed at military planning strategies and natural disaster planning where the military may be involved.

Dr Andrzej Goscinski, with substantial ARC (Australian Research Council) funding, is running RODos – a research project in distributed operating systems. Three PhD students are working with him on the project.

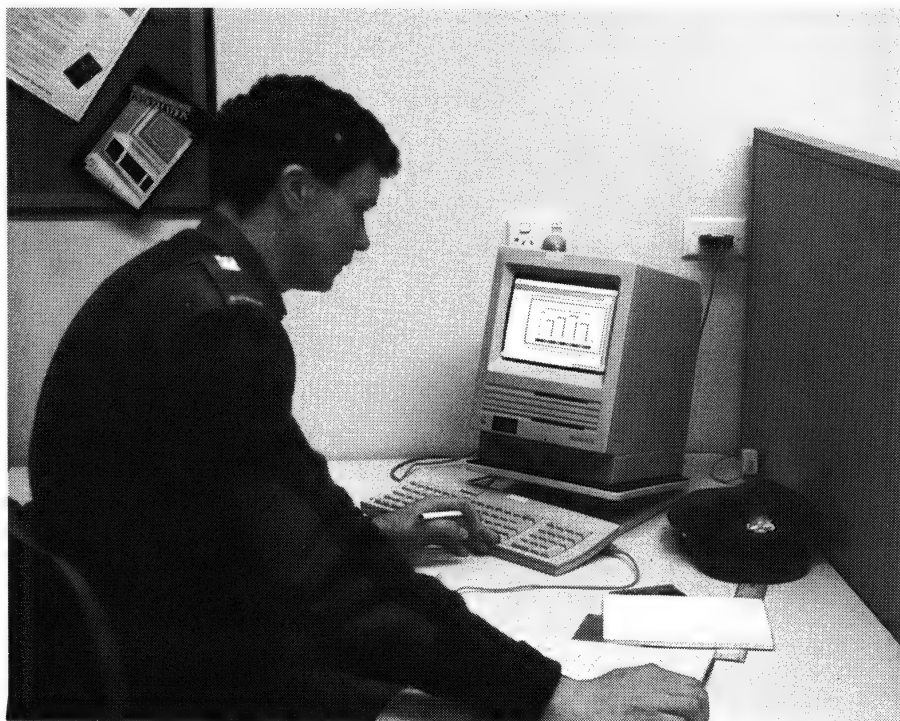
A Telecom research grant of \$500,000 is helping Professor Jennifer Seberry's research into cryptography. There is a lot of international interest in the work of Seberry and her team because they are researching 128-bit encryption, which is double that previously attempted. A project on speech research and recognition is being run by Michael Wagner. The aim is to neutralise the problem of accents and pronunciation when computers try to recognise words.

Quaine sees the trend for computer science as being more and more towards software courses and research. 'If you like, we are talking about software engineering versus computer architecture. Students interested in hardware and computer architecture will tend to take courses with electrical engineering.'

The average ADFA cadet taking basic information systems courses gains a knowledge of spreadsheets, wordprocessing, graphics and text, database work, Unix and Pascal – all on the Mac. 'One of the few complaints we have from our students is not getting enough time on the Macs when they leave us. While they are enrolled in our computer courses there is access to the terminals day or night, and they get used to having a Mac available whenever they need it.'

As well as taking students from all over Australia, the ADFA also has intakes from New Zealand, Thailand, Singapore and Malaysia.

Networking the department was relatively easy because they were able to co-ax the new buildings during construction. As well, the whole campus is wired with broadband and Ethernet. □



*The Macs at the ADFA have been upgraded to SEs running AUX for classroom use; each classroom Mac has twin floppy drives with networking to a file server running Unix.*



*In addition to classroom work, the Academy's Macs are used for research into such fields as artificial intelligence for use in natural disaster planning, cryptography and distributed operating systems.*



# QUICKPAK PROFESSIONAL

ONE OF THE NICE things about QuickBasic is its support for libraries. These can be written by the individual programmer, or purchased from third party vendors. They offer great improvements in productivity, as a simple call to a library function can replace reams of code. Performance gains can be dramatic, particularly when a library function is written in assembler, and these can offer features unavailable from within Basic.

Several vendors of third-party libraries for QuickBasic and Microsoft Basic 6.0 have appeared over the last couple of years. One of these is Crescent Software, which has a range of no less than 13 libraries and utilities for QuickBasic and Microsoft Basic programmers. Their premier library is QuickPak Professional, which has around 400 assembler func-

John Hepworth has been checking out a library of 400 QuickBasic functions.

tions, assembler sub-routines and Basic sub-programs. For simplicity, from here on the word 'function' will also mean sub-routine and sub-program, and QuickPak Professional will be 'QP Pro'.

The program divides its many functions into several groups. Each of the groups contains a number of functions with a related purpose. The groups are arrays, Dos, Menu/Input, Keyboard/Mouse, Strings and Video. There are also many miscellaneous functions. Major Basic sub-programs, ready to add to your program, include a

text editor with word wrap which can handle files thousands of lines long, a file browser that can display files of any length, and a spreadsheet where the programmer determines the number of rows and columns that will be available.

## Array functions

THERE ARE AROUND 30 array functions. Some insert an element into an array, delete elements from an array, or initialise arrays. Others dimension bit arrays and set (or get) values of individual bits. Others find the maximum or minimum element in a numeric array. There's a good range of assembler sub-routines to sort arrays, with different versions depending on the type of data in the array – integer, long integer, single precision, double precision, variable length strings, fixed length strings and user-defined data types. In each case, the arrays can be sorted directly, or a parallel index array can be sorted without re-ordering the actual data in the primary array. Finally, there is an assembler sub-routine to sort (using multiple keys) an array of user-defined data types.

The Dos functions are vital to any programmer. By themselves they are a good enough reason to get QP Pro! There are functions to open, close and process files using file handles, load arrays from disk at high speed and save arrays to disk at a similar speed. There are others to indicate the Dos version, the amount of free space on a disk, to give full information about a disk, and sort files. Functions can get or set drives, attributes and directories, and read or set volume labels. It's even possible to read or write sectors. Finding the default drive and directory is easy, as is changing drive or directory. Stringing together a few QP Pro functions can read file names and details from disk, sort them, and load them into a menu for selection.

The QP Pro Dos function called EXE-Name returns the full name of the file being executed (including drive and directory) making it easy to look for configuration or data files, and SetLevel sets the

The screenshot shows a file viewer window with a list of files on the left and a detailed view of a selected file on the right. The file list includes:

FILESORT	OBJ	13k	ISORTI2	BAS	3k	PICKLIST	BAS	5k	READSECT	BAS	4k
FILL	BAS	2k	ISORTSTR	BAS	4k	PRO	LIB	168k	REPLACE	BAS	2k
FILLSCRN	BAS	1k	ISORTT	BAS	3k	PRO	QLB	98k	RPTKEY	BAS	1k
FIND											
FINDT											
FLINPUT											
FLUSH											
FNOTHER											
FNSPREAD											
GET1STR											
Press Q											
SETATTR											
SETCNF											
SHIFT											
SHOW-IT											
SHOW-IT											
SHOW											
SHOW											
SHOW											
SHOW											
SORTI	BAS	2k	TESTCURS	BAS	1k	VIEWFILE	BAS	15k			

The detailed view of 'SHOW.BAS' shows the following code:

```

IF LEN(F$) = 0 THEN
  CALL WindowMgr(1, 1, 10, 10, 12, 70, 79)
  CALL PaintBox(11, 11, 11, 69, 79, -1)
  LOCATE 11, 11
  Message$ = "Display which file: "
  CALL QPrint(Message$, -1, -1)
  LOCATE 11, 11 + LEN(Message$)
  INPUT : "", F$
  CALL WindowMgr(1, 0, 0, 0, 0, 0, 79)
  CALL ScrnRest(1, 1, 25, 80, SEG ScrnBuff%(1), -1)
END IF

IF LEN(F$) = 0 THEN
  GOTO EndIt
END IF
  
```

At the bottom, it says: "Total of 1397100 bytes in 218 files. 0 subdirectories. C:\PRO>show show.bas"

This file viewer was written using QuickPak Professional – note the scroll bars and the shadow around the window.



Dos error level when the program terminates, allowing a batch file to branch as required.

DosError and WhichError are two vital QP Pro Dos functions. All of the other Dos functions return a value to indicate if they terminated correctly. DosError can then detect if an error has occurred, and WhichError can return the error number, allowing simple error handling in-line. As an example, a call to the QP Pro function to change directory, and the associated error handling, could be –

```
CALL CDir(NewDir$)
IF DOSError% THEN PRINT WhichError%
"occurred"
```

– this is much easier than an 'on error GoTo' plus an error-handling sub-routine, isn't it?

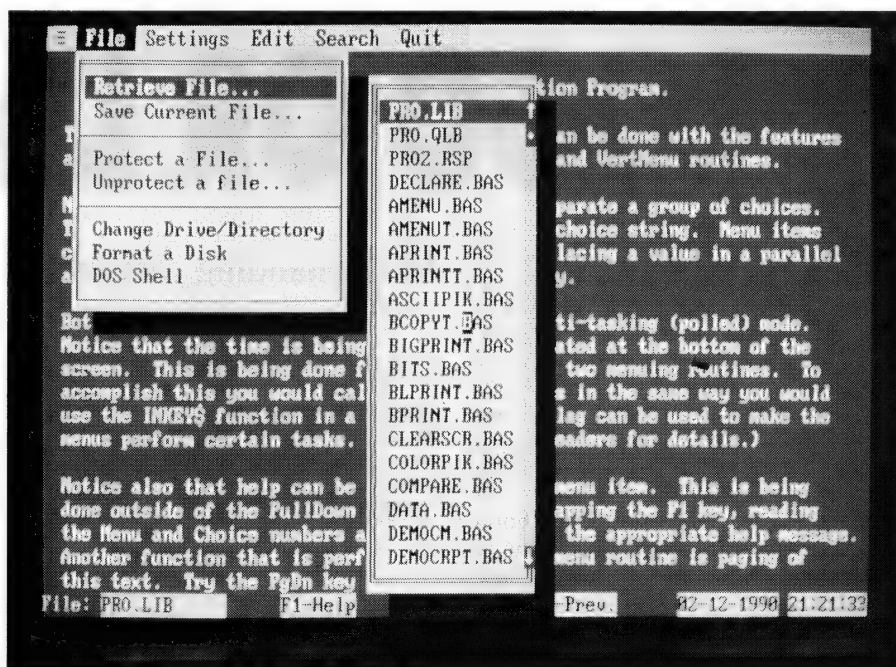
QP Pro also has several valuable menu functions, allowing easy display and selection of options. Some emulate the Lotus-style bar at the top of the screen, while others can be pulled-down. Finally, there is a menu which displays a list of options in multiple columns, looking a lot like the list of file names in Microsoft Word. Included in Menu/Input functions is a routine to edit a string on screen. All of the menu and input functions have variations with mouse support.

Other routines can detect the status of the CapsLock, NumLock or ScrollLock keys, and turn them individually on or off. Even more routines can clear the keyboard buffer of any keystrokes that happen to be in it.

## String functions

THERE ARE STRING functions to expand tabs to multiple spaces, and to shrink multiple spaces to tabs. Others emulate the Ucase\$ and Lcase\$ from Basic, but do it much faster, and a ProperName function sets the first character of each word in a string to upper case, and all others to lower case. Others can encrypt and decrypt a string (great for password files), remove all embedded blanks, translate all of those box-drawing characters to hyphens, bars and plus characters, convert all control characters in a string to a user-defined character, and strip high bit characters.

The video routines are, like the Dos routines, particularly valuable. Screens and parts of screens can be saved to arrays and restored from arrays. Areas of the screen can be painted with new colors without affecting the characters, or areas



QP Pro's library of some 400 functions can be used for such things as adding a calculator or calendar to your own program, an MS-Word style file selector, or a pull-down menu system, as shown here.

of the screen can be filled with new characters without affecting the foreground and background colors. There are even functions to determine the current foreground and background colors, while others write strings quickly to screen or generate boxes.

There are many other valuable functions, including many mathematical and financial functions. Others convert temperatures between Fahrenheit and Celsius. A calendar function pops up a calendar for any month and year, while ASCII-Chart pops up a display of all the ASCII characters. Block copy routines can move up to 64K of data from one memory location to another, Calc adds a pop-up calculator to your program, and there are a great number of date and time functions.

QP Pro comes in a comprehensive package. The cased ring binder contains a manual about 40mm thick, plus four 360K disks. They contain self-unpacking archive files, which unpack to around 561 files with a total of around 2.8Mb. The library files PRO.QLB, used in the environment, and PRO.LIB, used to make .EXE files, total about 250K. The other 2.5Mb is source code for all the assembler functions and sub-routines, source code for some very useful sub-programs written in

Basic, and source code for a vast number of powerful demo programs using all the functions, procedures and sub-programs.

Now, when starting QuickBasic, use the command 'QB yourfile.bas /L PRO'. This starts QuickBasic, loads the PRO.QLB library, and uses it while in the integrated environment. It also automatically links the .OBJ files to PRO.LIB as well as BCOM-45.LIB to create .EXE files. The assembler functions and Basic sub-programs must be declared at the top of your program, while declaration of the assembler sub-routines is optional.

## A vital tool

QP PRO IS AN excellent library, packed with around 400 vital assembler functions and sub-routines. It also has a good number of powerful and useful Basic sub-programs. Of vital importance is the inclusion of full source code for all assembler functions and sub-routines, plus Basic source code for the sub-programs. If you program in QuickBasic or Microsoft Basic 6.0, and you don't use QP Pro, then you're almost certainly working too hard!

QP Pro is a product of Crescent Software and distributed by Softerm Australia, 120 Pacific Hwy, St Leonards 2065 NSW; (02) 438 4299. The package is \$295 rrp. □



# LOGO OR LATIN?

ONCE I OWNED a typewriter. It was a heavy machine, but portable and produced a fine row of type in one font. I didn't know then what a font was, nor did I appreciate the limitations of having only one of them. It was possible, with a little perseverance, and using that latest technological marvel – the two color ribbon, to persuade it to type in two colors. If you did this, most of the letters were either red or black, but a few were piebald. I loved this machine. It enabled me to do everything that a biro would, but much more neatly and only a little more slowly. Using it, I once justified a piece of text. As I remember, this text was five lines of about ten words each and justification entailed: typing the text, counting the characters in each line, deciding where to insert characters to make all the lines of equal length, and then re-typing the whole thing. I was most gratified when a friend asked 'How did you do that?'

I gave my typewriter away shortly after obtaining an Apple IIe and Zardax, that marvelous, far ahead of its time, wordprocessor. I remember very clearly checking out available wordprocessors, settling on Zardax, and thinking that any more than it offered would be self-indulgence. How could one use more features than this marvelous program offered? Times have changed. Recently, I found myself musing on the shortcomings of Word 4.

Since my own conversion on the road to 'Mac-heaven', I have shown many people the joys of wordprocessing, and how any wordprocessor does more than any typewriter. I have never found a person who, having used a wordprocessor, wished to return to a typewriter. The important point in any such instruction is not which keys to press to get the desired result, although you will need to know this to get any result, but the idea of wordprocessing. The understanding of the set of powerful concepts underlying a wordprocessor is crucial. A friend, who was responsible for a large office once said to me 'But we don't need wordprocessing, we don't do many form letters'. He had missed the idea behind it.

And, in this there is, perhaps, a lesson

**Understanding computers will soon be essential for most students hoping to join the work force – Peter Spencer wonders if 'computing' is being taught to reflect that?**

---

for the teaching of computing. It is easy to teach the key strokes but a lot more difficult to teach the ideas underlying those keystrokes. There is a great danger in teaching school children the details of a particular computer, wordprocessor, database, spreadsheet, operating system or computer language, and missing the concepts underlying these entities. No subject changes more rapidly than computing. In 10 years, personal computing has gone from 4K machines to 2000K machines with calculating power approaching that of a minicomputer.

---

*We must avoid 'relevance' in the sense of keeping an eye on the market-place and producing students to fill perceived slots.*

---

## **What should we teach?**

I AM, THEREFORE, rather puzzled as to just what computing we should teach in our schools. I am certain that we should not worry too much about specifics, except in so far as these are needed to persuade the machines to perform. I am certain that relevance is to be avoided at all

costs because, as in most things, and certainly in computing, few things are more irrelevant than last year's relevance.

To the MMITS (mythical man in the street), computing means programming. We know the fallacy of this, but let us for a moment consider what we should teach a future programmer (or systems engineer, or database manager, or future activist in any computer technical field). Such teaching will surely begin early in the school career of this hypothetical student. This means that he (or she) is probably at least five (and perhaps eight or nine) years away from joining the work force, and the one thing of which we may be confident is that, whatever machine we use for our training, the machine that our students finally use will be very different. So, let us not spend too much energy on the choice of machinery, but rather decide on what is to be taught. (This doesn't stop me, if asked, from recommending the Mac as the best available personal computer for any use. But that is a different discussion – I do have reasons and they are not arbitrary.)

What do we teach? We must avoid 'relevance' in the sense of keeping an eye on the market-place and producing students to fill perceived slots. Schools can not, and should not, try to train either secretaries or systems engineers. In this context, the avoiding of fleeting relevance does not mean teaching the irrelevant. Whatever we teach must have a sound basis and some intellectual content. This is surely possible with computers which must rank as one of our most significant intellectual achievements. Just as schools are not vocational training grounds, they are not universities. They don't have the resources, staff, time nor inclination to teach computer science. Schools need to concentrate on the computer as a valuable tool and to demonstrate ways in which the computer makes hard jobs easier and impossible jobs possible. To this end, the often integrated quartet of wordprocessor, database, spreadsheet and communications are an essential basis, always remembering that it is not the particular program which is important, but rather the concepts underlying each.



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But what about computer languages? What about real programming? Logo may be valuable; it was designed as a teaching language, and students enjoy it. I am not completely convinced about Logo's benefits, but the shortcomings may be mine rather than Logo's. Basic? Experts universally revile it, but I am fond of Basic, and later versions are quite powerful and easy to use. Some short experience with Basic can provide a feel for ways in which a computer can be programmed and this is probably worthwhile. In my experience, most students are not turned on by programming, and why should they be? Learning to write a worthwhile program is a process needing a substantial amount of hard work and a fair degree of maturity. Today, the great majority of computer users will never need to program anything.

## What language

SO WHAT LANGUAGE is best for a future programmer? How about Latin, French, German or any other human language? Human languages are, after all, about the

manipulation and transfer of large amounts of data. They are data structures of great complexity and elegance. Their understanding and manipulation requires

*Schools need to concentrate on the computer as a valuable tool and to demonstrate ways in which the computer makes hard jobs easier and impossible jobs possible.*

study and effort and provides substantial rewards. Furthermore, it seems likely that one of the many hurdles in the developing

of machine intelligence is our very imperfect understanding of the way in which our own languages function. It might well be that linguists will provide insights into the functioning of the human mind which will eventually enable us to better design a machine-mind smarter than a bumble-bee.

Here then, is my recipe for avoiding fleeting relevance, and yet, teaching relevant subjects which will provide maximum benefit for students intending to make computing their career. Firstly, introduce computing early in a pupil's school career via wordprocessor, database, spreadsheet and communications. Secondly, provide computers as tools for a pupil's entire secondary schooling. And, thirdly, teach languages and other intellectually demanding subjects which will give satisfaction and cultural benefit and may even provide insights into our own methods of thought.

If you think that this means that I have doubts about technological high schools, then you have, as they say, caught my drift. □

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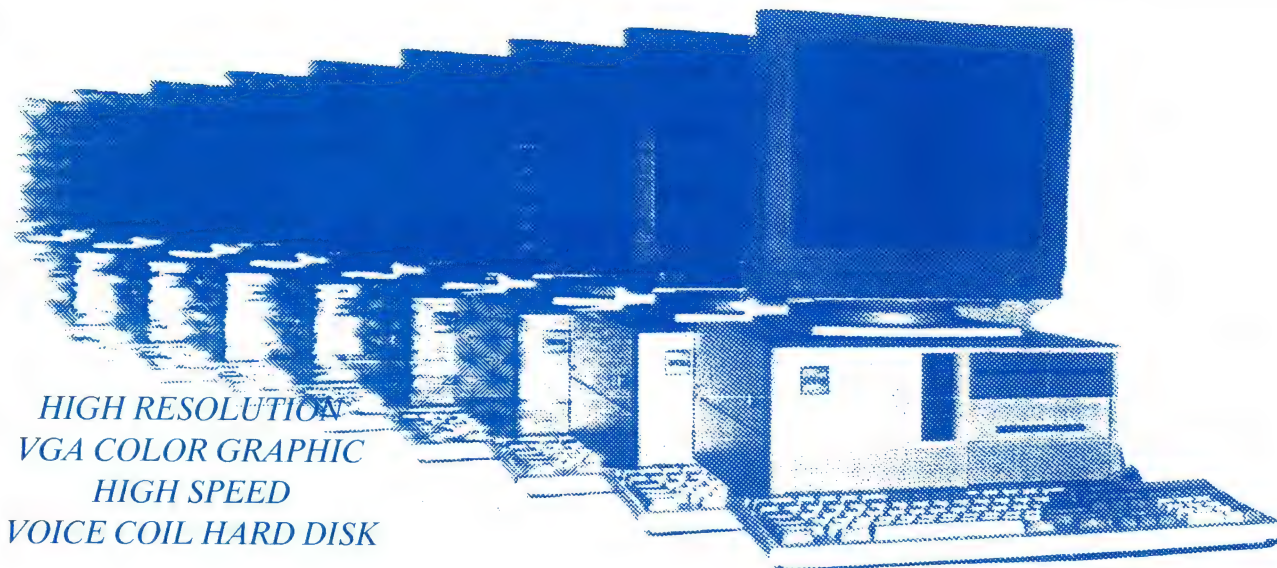




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# Your Computer/Commodore Amiga Software Competition

## The Winners!

THE ENTRIES in the Amiga Software Competition that *Your Computer* and Commodore sponsored in the November and December issues of YC, were tricky to judge. We had asked entrants to simply 'write good Amiga software' – and they did! Entries were of an exceedingly high standard, especially in the area of presentation. Thank you to all those who went to so much trouble in preparing, packaging, documentation and marketing plans so professionally. It is a shame we cannot award every entry for such diligence and enthusiasm.

Commendation prizes were granted to two entries.

David Boddy of Canberra, already renowned for his talents as an Amiga animator and artist, presented yet another rendition of the famed Star Trek program. No points for originality, but this contest was not based on theme alone. Boddy has been playing Star Trek since the first games appeared on mainframes some years ago; since then he's played countless versions on various computers – he incorporated his choice of the best features to develop the entry and then made use of the Amiga's flexible sound and graphics capabilities.

Boddy wrote this Klingon dissolving caper using The Director – a language intended primarily for presentation work, not the calculation of matrix warp travel or torpedo paths. A truly wondrous feat – well done, David!

From Brisbane, Ronald Chernich's entry takes us from the edge of the galaxy to the innards of your microprocessor. His AT-6 is the essence of every would-be assembly language programmer's dream – it's an easy to use assembly language tutorial. AT-6 is the painless way to tackle the op-codes, acronyms, pseudonyms, machines codes, order codes and permutations of all of the above. The software is written in 68000 assembler and the code has been extensively modularised. Chernich used the Manx Aztec Assembler and Linker, and Debugger. It's a very powerful, well thought out package with plenty of practical value for 'programmers and enthusiasts who feel an inclination to experiment with 68000 assembly language program-

ming,' in Chernich's words.

Boddy and Chernich will each enjoy four days on the sunny Gold Coast, accompanied by three 'guests'.

The grand prize of a trip to the Amiga Software Developer's Conference was won by a down to earth business application – an area in which the Amiga needs all the support it can get. Victorian Robert Glucz impressed the judges with his marvelously packaged, documented and designed program called Quota. As the name suggests, Glucz has produced a solution to that awkward old process of producing quotes, the bane of many small businesses. We received what appeared to

be a complete commercial package with tutorial, installation disk and demonstration mode.

The screen design is consistent and easy to follow. There are plenty of intuitive features and the instructions are pleasantly presented. The user interface makes good use of the Amiga's gadgets and pull-down menus. This is a thoroughly polished example of a business solution that is sorely needed for the Amiga, and one which has amazing potential in many service industries. Have a great time, Robert – the conference will be held in May/June 1990, at a location in North America to be announced. □

QUOTE NO. 00003		29/07/89	
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PART	MAKE	MODEL	QTY COST
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NOTES	Price quoted is valid for a period of 30 days.		
TOTAL			\$ 5291.74
SIGNED			
ACCEPTED			

*Robert Glucz, of Knoxfield Vic., developed his winning entry, Quota, to give business users 'the competitive edge – and to that end, the program provides an integrated system of quotation preparation and despatch, modeled on the way real quotations are produced.'*



# HYPERTEXT OR JUST HYPE?

## - Part 2

Is hypertext the key to the PC's potential, Stewart Fist wonders, or just a curiosity?

**T**HE REASON HYPERTEXT ideas are suddenly becoming important is possibly because this is a transition period in personal computing. The computer's supreme ability to manipulate 'user-generated' text, numbers and graphics (the machine intelligence that has driven the PC revolution until now) is gradually becoming secondary importance.

The communications side of computing is fast assuming a role of equal importance to text and number crunching. But, of even greater importance in this decade, is that the main role of our desktop computers from now on will be to manipulate text, numbers, graphics and even motion video information input by some of the five billion other people in the world, rather than by just yourself and your work-group.

The power and capacity of your own computer will cease to be of primary importance – it is what this computer can identify, access, select and present in a meaningful way that becomes paramount.

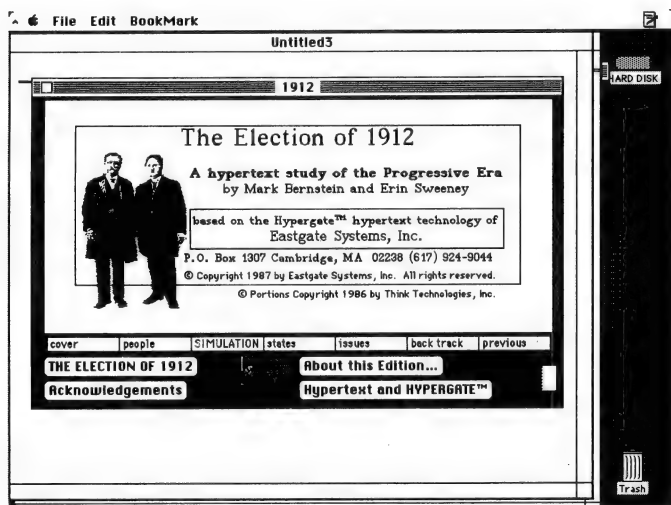
You've heard this before, but it needs to be repeated: one CD-ROM disk (costing \$2 ex-factory) for instance, can hold 550Mb of text information, which is roughly three times the amount of text

that a fast touch-typist can generate in a life-time. There are now 300,000 CD-ROM units in use around the world (about 50/50 for Mac and IBM systems) so the disk market is getting closer to that magical mass-consumer product level where we should get cheap (\$20 retail) disks.

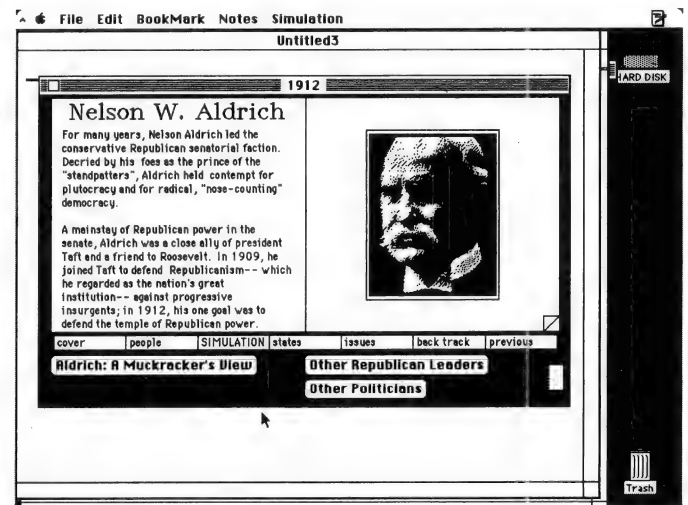
Online database systems have faced the same high-cost, low-usage problems in developing a market as CD-ROM, but for much longer. However, cheap dial-up data links (ISDN's 64kbps) are now with us nationally and internationally and this should make a big difference to costs. In this decade we should see the development of cheap online database systems which are aimed at the mass-market, and just one of these databases would likely hold more material than you could read in a couple of lifetimes.

Two hundred years ago, the great philologist Samuel Johnson said, 'Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it'. In Johnson's day, it was libraries; now it is becoming databases.

Until now, we were in a phase of computing which was the electronic equivalent of the paper-based information systems of the 14th century. Scholars at this time had relatively cheap paper, but



1912 is a high school level tutorial and simulation game written in Hypergate (which is essentially similar to Hypercard). This is the first 'cover' card.



The 'people' area in the standard bar makes connection to a list of the key political figures of the day. These then have a biography (as seen here) and other relevant material.



all their books were laboriously handwritten on a one-by-one basis by employed scribes. Then Gutenberg came along and information was mass-produced and widely disseminated – they printed eight million books in the first 10 years.

We are entering the electronic Gutenberg age of mass-processed, instantly communicated information, which doesn't mean that we will abandon the keyboard or disk any more than printing destroyed pen and paper. It is just that our computers and telephone connections are going to be much more useful in the future than they have in the past.

ISDN telephone systems, QPSX metropolitan area networks, optical-fibre undersea and terrestrial cable, CD-ROM and other optical disk standards, and an enormous variety of online databases are going to be the basis for this revolution, and the personal computer is merely a sophisticated peripheral.

Although printing gave us enormous libraries of information accessible within a geographic locality, it was the system of cataloging and card-indexing that enabled us to organise and reorganise the information in these libraries and make them useful, and this is where hypertext and other information retrieval techniques fit in. Cross-indexing is the fundamental tool of 'knowledge' processing, and hypertext is a cross-linking tool, but it goes further than just providing a path between modules of information.

The process of cross-referencing, extracting, comparing, condensing and re-working information and concepts has allowed us to develop more concise modules of knowledge and reduce unnecessary learning. The level of knowledge that Newton had about physics in his most productive years can now be surpassed by a high-school student of fourteen. This is possible because of the on-going community process of refining each generation's knowledge, discarding outdated concepts, and constructing new 'coherent' theories in light of the new data. Discarding old intellectual baggage is essential if we are to progress.

'Knowledge is not the same as information,' said Feigenbaum and McCorduck in *The Fifth Generation*. 'Knowledge is information that has been pared, shaped, interpreted, selected and trans-

formed; the artist in each of us daily picks up the raw material and makes of it a small artifact.'

Computers now give us the power to do all this on a global scale; with enormous volumes of information, with quicker and more extensive cross-referencing and access, and with text, graphics, sound and motion video.

All this is becoming possible because of the electronic nature of the medium, and the fact that information can be readily updated, appended with dissenting opinions, instantly communicated over long distances, selectively provided to 'experts' for updating while simultaneously being made available on a read-only basis for students. Authors for each information module can be identified and paid on a 'per use' basis, so the capitalist-market incentive can be included.

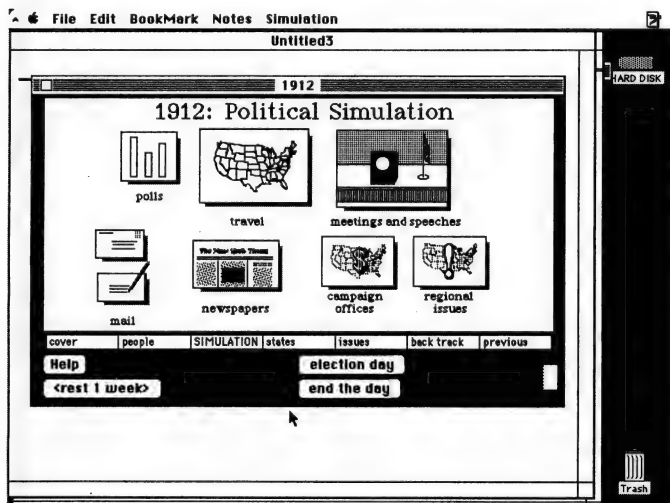
These electronic databases can grow organically with no practical upper limit now that we have supercomputers and optical disk storage. And, all of this makes the prospects of very large 'cooperative' online systems very attractive in education and general information applications. Some people see the possibilities of massive electronic publishing projects being continually updated by contributions from the international academic community.

These databases will no doubt include hypertext links and the other hypertext-like processes, but they will also have indexed word searching, and probably parallel electronic mail and keyboard conferencing networks as well. In time, these databases could take over as the central repositories of knowledge in the global village (a prospect that is not without its dangers also).

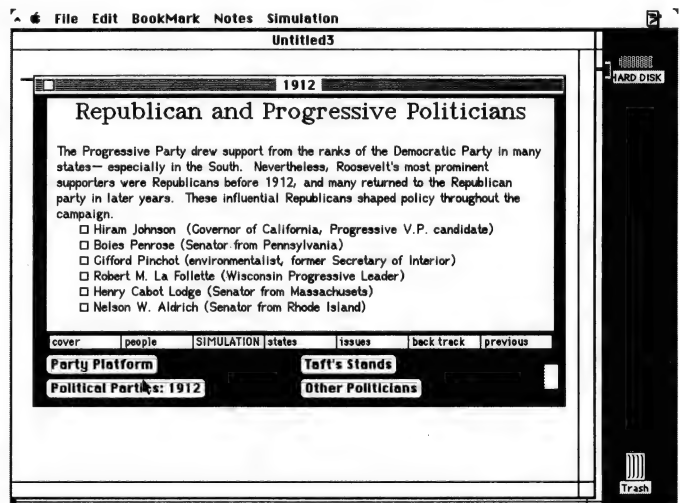
This is the aim of hypertext-pioneer Ted Nelson's Xanadu Project in the US. Xanadu has just received substantial financial backing from Autodesk Inc., and Nelson is close to being able to show a practical product.

Nelson says about databases, that 'just as the small system promotes cumulative order, the larger system promotes the coexistence and resolution of many viewpoints through the sharing of private documents and comments, and the publication of hypertext complexes whose interrelationships remain orderly'.

Nelson speaks like that at conferences too! But you can deci-



A distinct branch of the Hypergate program is the simulation game which assumes that you are a campaign director. Your role is to manipulate the campaign elements selected from this icon list.



The platforms for all three major parties in 1912 are a key to understanding the election background. Note that Nelson Aldrich's biography can be approached from this direction also.



*'A Hypertext document engages its reader in a manner which a paper document cannot. Conventional media force the author to impose a single, permanent organisation upon the document, while hypertext lets the author and the reader cooperate to shape the document to the reader's personal inclinations. The reader becomes an active participant, the author's co-conspirator' – Mark Bernstein author of Hypergate*

pher what he means. His aim is to create a universal distributed database system with the information stored and accessed according to a universally-agreed set of rules, and using hypertext principles. Everyone should be able to get access to any document, sound recording, still or motion image online through the telephone network.

Nelson isn't alone in believing that hypertext designs are the key to our future computerised education and information systems. Another enthusiast is US guru Eric Drexler, who says that this form of hypertext publishing will 'speed the diffusion and evaluation of ideas, helping society apply its collective knowledge more effectively'.

In a politically perfect world, this wouldn't be a worry, but I don't particularly like the idea of having a single body of reference information. I think the danger is mainly in creating a single 'authorised' version of the truth. When we deal with books, the serious student reads a whole lot of different interpretations – not just one. Although, to be fair, most hypertext enthusiasts do stress the need to provide links to contrary opinions, and allow dissenters to annotate information.

So, when we talk about hypertext and hypermedia systems, we aren't just considering HyperCard for the Macintosh, or Owl's Guide for the Mac and IBM PCs, or HyperTies, or the half-dozen other hypertext programs that you'll find in the shops at the present moment. These are only toys to help you come to grips with the concepts – the hypertext equivalent of those 1K text editors in the '70s which became wordprocessors in the '80s, and eventually grew into those highly sophisticated integrated WP/desktop publishing programs we use today. The future is in big systems, and probably with online databases.

What transforms data to information, and perhaps information to knowledge ('concepts') in a hypertext system is the links. Look at a simple example of English grammar and you'll see what I mean. 'The cat sat on the mat' is one element of descriptive data. 'It is warmer on the mat than on the lino' is another basic descriptive element. When I link these two pieces of data, as in: 'The cat sat on the mat [because] it was warmer on the mat than on the lino', then I am raising the quality level of the two descriptive elements to a higher plane. If you learn something about the behavior of cats from this experience, then generally we would classify the outcome of this linking as creating 'knowledge' (or dignify it as a 'concept').

Similarly, with hypertext: suppose I link a module of informa-

tion on Hitler's fascination with astrology, with another module which deals with the timing of Hitler's attack on Poland and the start of World War II. Am I using this link to claim a 'causal' relationship? Am I suggesting that the timing was based on astrology? Or am I simply pointing out a coincidence? And, by extension, am I listing astrology as one of the causes of WWII, or pointing only to Hitler's superstitions? Or perhaps the link has no more significance than the fact that Hitler figured strongly in both modules?

Here is the danger of hypertext linking with large systems – although you aren't likely to run into these problems with HyperCard. In the grammar example above, the word 'because' identified the type of relationship that I postulated (causal) between the cat on the mat and warmth. But, you can read into my hypertext link whatever relationship you choose – all the link really says is 'I think there is a relationship here between these two modules'.

Is this good or bad? Well, it's probably sometimes good for original researchers since it doesn't provide pre-digested conclusions, but it's bad for student guidance since the relationships can be easily misinterpreted. Just because the linking relationship isn't specified doesn't mean that the link is neutral – people will place their own interpretations on it.

When you get down to basics, our information systems are extended human-memory systems, where the fundamental aim is to allow each generation to build on knowledge acquired by the last. If we don't provide some form of guidance thorough the information, then we lose the value of past experience and thus, each generation would have to build from scratch.

So guidance is essential, which doesn't mean that each generation has to follow the last blindly (we would call this 'dogma') but it does mean that we are able to interpret the implied nature of the links, and accept or reject these ideas in the light of other experience or logical construction.

Therefore, we need to consider to what extent does hypertext

## Guide to hypertext

OWL'S GUIDE, WHICH is available for both the Macintosh and the IBM PC, is probably the best all-round program to give you some understanding about the way large-scale hypertext programs will function in the future. Guide has four hypertext-like functions: It supports both text and graphics, and it has live-area indicated by a change in the cursor. If you click on a live-area in the document you may get:

**Note** – like a footnote, but which pops up on the screen and remains open only while the mouse-button is held down.

**Replacement** – new material which replaces the existing material on the screen. A one-word heading may be replaced by another word, or by a whole chapter, each with its own range of live headings. You can define any number of Replacement buttons within Replacements, and in effect, these can have a hierarchical relationship similar to idea processors and outliners.

**Inquiry** – a variation on the replacement system where you are provided with multiple choices and each of these is mutually exclusive. Click on one and it expands, however, the other choices disappear. This has application mainly with education and training for multiple-choice testing.

**Reference** – this is the true hypertext function which jumps you to a new location, either in the current document or in an entirely different file.



linkage create meaning? And, can a link be interpretatively neutral?

## What HyperCard says

TECHNICALLY, THE HyperCard link says nothing more than Goto, but its semantic meaning depends on how it is used. Current research with academic hypertext systems suggestion that it is possible to distinguish somewhere between 20 and 26 possible different link-types, but when you look at the shortened list below, you'll see the categories flow over into each other, so don't consider any list as definitive.

These are probably the seven major link relationships: causing (the link suggests that A causes B), similarity (the link suggests that A is similar to B), being (the link suggests that A is member of set B), showing (the link suggests that A is an example of B), using (the link suggests that A uses B), having (the link says that A has, or can be, associated with B), and including (the link suggests that A includes B).

The point about all this is, of course, that many hypertext researchers and developers are attempting to find ways to reveal what form of link has been created. Xerox Parc's NoteCard has taken this idea and incorporated it into 'concept maps' which attempt to reveal the nature of the links by allowing free-expression comments on the map. NoteCard goes even beyond that.

This is all pretty esoteric stuff so I'm not going to take it any further. If you are interested, you'll find more in the new journal *Hypermedia* (ISDN 0955 8543) at your local library. If they don't subscribe, bother them until they do. You won't want to subscribe yourself because it will cost you \$US85 for three issues of less than a hundred A5 pages!

Possibly the major concern with the design of large hypertext systems at the present time, is navigation, and the associated problem of disorientation. The most common solution seems to be to provide the user with a map, or rather a section of a map, showing the immediate surroundings of the module which is currently on display, but to work effectively, this map needs to be readily at hand.

Some programs provide both a local-area map, and an overall schematic of the layout of the complete file – a sort of satellite overview for orientation. This assists you to find your way from one module to another and helps overcome one other problem with hypertext – a lack of confidence that you have seen or read all the relevant material. Since you don't have all the material laid out in a straight linear construction, it is often hard to be sure that you haven't missed vital modules of information about a subject.

So, a related problem is that of marking those modules you have already seen. In any hypertext session you'll find, time and time again, that you click on a button and return accidentally to a module that you read 10 minutes ago. This is not always bad, but it can be infuriating if you keep coming back to the same module. Thus, some of the new programs mark the map modules (they call it a 'footprint') to help you remember where you've been.

Another navigation problem is in finding your way back to a module you've previously seen. If you've had any experience with hypertext programs of any kind, you'll know what I mean – backtracking is essential. HyperCard and Guide both provide very sophisticated means of retracing your steps even when you've move a long way past the module you need. And, if you discontinue a session, you need to be able to 'bookmark' your position and record your footprints so that you can start again at the same point.

## Hypertext basics

LAST MONTH I looked at the basics of hypertext and we touched on the philosophies behind this relatively new approach to organising information – an approach that is only practical with computers. To refresh your memory, the point was made that hypertext (and the later development of hypermedia) are characterised by –

- A modular or 'molecular' approach to the storage of information, as against the traditional hierarchical or linear data structures that our present information systems generally use. These modules of information can be card-sized (as in HyperCard) or document-sized (as in Owl's Guide).

- Links which are established between the modules of information. These links represent relationships of some kind, and they are established by human decision (author or user) and not imposed by the structure. One key characteristic of hypertext/media systems is that the links are easy to create and use. The links may be uni-directional or bi-directional, and ideally, they are 'anchored' in the relevant information (not the modules) at both ends.

- Activating links is usually as easy as mouse-clicking on a word, icon or image in the module (a button). The script hidden behind this button then performs the function of taking you to: another part of the same document, a different document in the same file, a different document in a different file; or it may run a synthesized voice or music program, start and run a videodisc or CAI program, or initiate a combination of all of the elements above.

- As a consequence of the above, a hypertext system is a meshed network of information – a 'web' is the term most often used, and this creates navigational problems of its own. Hypertext becomes more valuable with large masses of data – but more data means more complexity, and complex hypertext databases need navigational aids (maps), special browsing applications, and (possibly) ways of identifying modules of data already seen.

- A distinction was also made between the hypertext approach to finding information, which is primarily to follow down tracks of links between modules, and the standard information-retrieval techniques where related modules of information are discovered by indexed search-and-select techniques. These are not mutually exclusive processes.

- While the lack of data structure, plus a module-linking system, probably defines hypertext, there are a few closely related concepts that fall within the area we are examining: simple 'subsidiary' modules of hidden text and graphics such as pop-up footnotes; multi-leveled hierarchical expansion of information heading as in outliners and idea processors; and the provision of differing levels of information complexity which can be chosen for a session, or changed on a module-by-module basis.

These points may seem trivial, but in large systems they can create real problems. However, as our systems develop and get standardised, and these navigation ideas are introduced more widely, the problems now associated with hypertext will probably appear less important. Certainly universities like Browns in Rhode Island in the US are finding value in some of their big hypertext systems, although these have taken many years to develop.

In fact, one of the problems that we will face with good hypertext systems is that they need screens large enough for multiple windows, and ideally these would be double-A3 size. □



# LAPTOP

Tom Moffat describes how to optimise a laptop's LCD display using the attribute byte.

**I**F YOU OWN A laptop with an LCD display, you'll certainly know it isn't as versatile as the CRT monitor of the type used with a full-sized PC. This is mostly because of the LCD's inability to show shades of gray. The situation is much like that with the Hercules-style monographics display system in which you trade gray-scale ability for the excellent resolution the monographics standard provides. In the LCD, we trade the gray-scale for portability.

Your software will most likely have an installation program or some other means to set up the computer's screen colors. What this really means is that the installation program manipulates the attribute bytes that go hand-in-hand with every character sent to the screen. If we understand what's in an attribute byte, and how it controls screen colors, we can then study what the so-called 'colors' do to an LCD display. Knowing this, we can then work out how to fiddle the attribute bytes to make the LCD screen do our bidding. This information only applies to text modes; graphics are a completely different kettle of fish.

Every text character stored in your screen memory consists of two bytes – one contains the ASCII character itself, and its next-door neighbor contains attribute information that relates to that one character only. So, if a character is at some screen memory address, its own attribute byte is at  $\text{address} + 1$ . This doesn't just apply to laptops, by the way. The whole concept of attribute bytes and screen memory applies right across the PC range, so owners of full-sized XT's and AT's will find this information useful, too.

As a matter of interest, there are several ways that user software can write characters (and attributes) to the screen. The most impressive method is to write characters directly to screen memory, with the attribute byte attached. Since the two eight-bit bytes are stored side-by-side, this can be done all in one hit by storing a 16-bit word. Thus, the method is very fast. There are also some routines that live within an IBM PC, even when no user software is loaded.

There is a good old fashioned Dos function call via Interrupt 21h, but these days, it's considered a bit slow. A more direct method is to bypass the Dos and go straight to BIOS, where Interrupt 10h contains a nice collection of functions to control the screen display. In many programs I write, I use function number 0Eh, which simply bungs the character onto the screen and moves the cursor to the next position. The attribute byte is copied from whatever was used for the previous character – you have no direct control over it.

Interrupt 10h has another function, number 9, which lets you send a character and an attribute to the screen at the same time. Trouble is, it doesn't move the cursor; you have to do that yourself. Why couldn't the PC's BIOS designers have combined the features of function 0Eh and function 9? Beats me. The effects of attribute bytes on an LCD screen were determined experimentally by playing around with function 9.

We will now descend into bit level for awhile, but don't worry, this will be simple and easy to understand. The eight bits of the attribute byte are used as simple switches that turn things on and

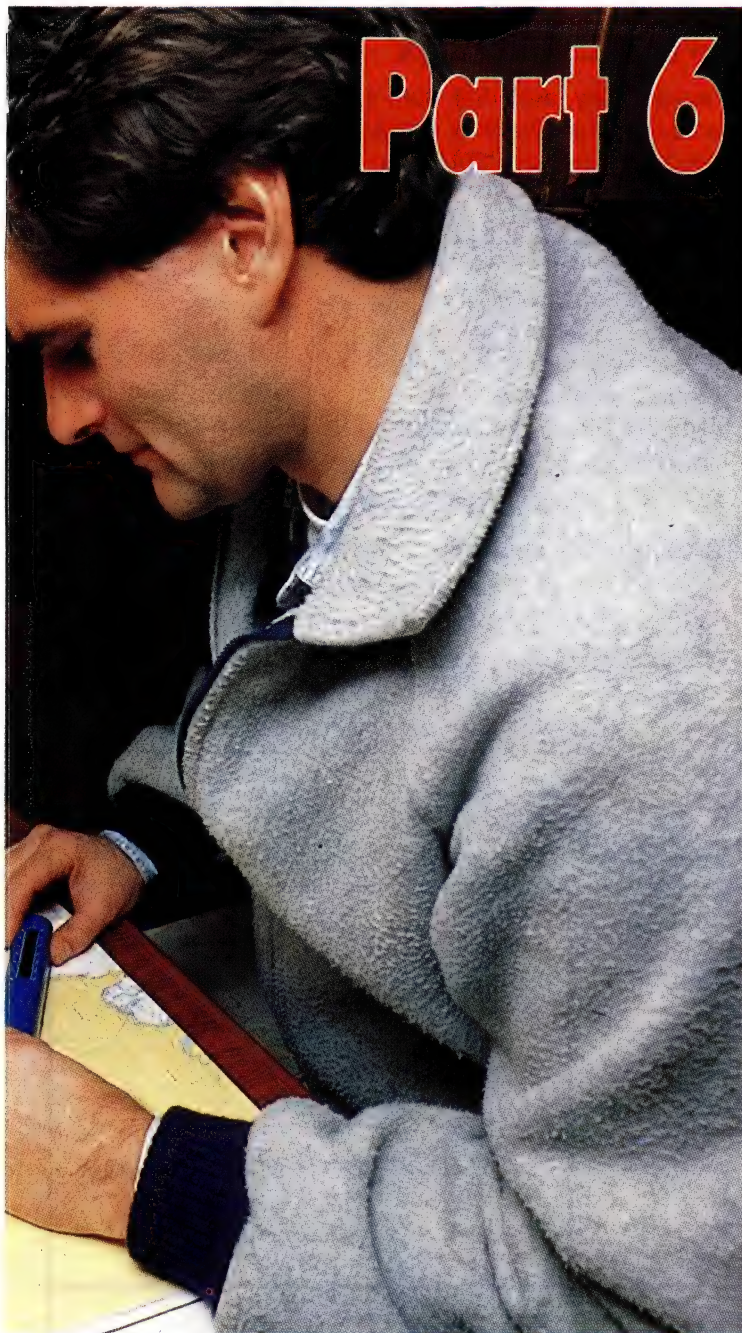


off. The term RGB monitor means the monitor has separate physical wires coming into it from the computer, that can turn the monitor's red, green, and blue colors on or off. Some more expensive monitors are known as RGBI types. They have the red, green, and blue control lines, as well as a fourth one that can select a brighter or dimmer display – the 'I' is for display 'intensity'.



# CLINIC

## Part 6



### The first four bits

LET US NOW look at the first four bits of an attribute byte, starting from the right-hand end. Bit 0 directly controls a hardware switch in the computer, which turns the monitor's blue color on or off. If Bit 0 is a one, blue is switched on. If Bit 0 is zero, blue is switched off. Likewise, Bit 1 is a switch for green, and Bit 2 is a

switch for red, and Bit 3 switches the color's intensity to high for 1 and low for 0. An important fact to remember is that the first four bits apply only to the *foreground* part of the character associated with the attribute byte, that is, the character shape itself.

Now for the next three bits along in the attribute byte. These control the color switches for the *background* part of the character cell, that is, the part of the character position which the character shape doesn't cover. Bit 4 controls blue, Bit 5 controls green, and Bit 6 controls red. And, as for Bit 7 (the leftmost bit), when it's high, the character will flash on and off. When it's low, the character does not flash. So there you have it, my friends, one attribute byte!

Screen colors are generated by using the three red, green, and blue primary colors either on their own, or in combination with each other – see Table 1. If you combine red and blue, you get yellow. Green and blue would produce green-blue, officially known as cyan. And, all three together – you guessed it – white! In the case of a monochrome amber or green monitor, the various color and intensity combinations produce up to 16 shades of 'gray'.

Let us now construct a truly garish and tasteless text display ... a red character against a blue-green background. For the foreground part we want red only, and for the background we want blue and green switched on. From Table 1 you can see we want Bit 2 switched on for the foreground red, and Bits 4 and 5 switched on for the background blue-green. The eight bits would be: 00110100, or 34 (hex). Want the red character lighter? Switch on the foreground intensity bit, giving 00111100, or 3Ch. And, to make it flash ... switch on Bit 7, giving 10111100 or BCh.

So what's all this got to do with a laptop? Well, knowing where the foreground and background bits are, along with the intensity and flash bits, we can make the LCD produce different appearances, at least, for what should have been different colors.

### Manipulating the attribute byte

THE INFORMATION given here has been worked out on a Toshiba laptop, a popular make indeed. The same techniques generally apply to other brands, too. It's a simple matter to test the effects of the attribute byte on your own computer, using the assembler in Debug.com. Here's what you have to do. First, fire up Debug,

6 5 4 BACKGROUND	BIT #	3 2 1 0 FOREGROUND
I R G B	I R G B	
0 0 0 0 Black	1 0 0 0 Dark gray	
0 0 0 1 Blue	1 0 0 1 Light blue	
0 0 1 0 Green	1 0 1 0 Light green	
0 0 1 1 Cyan	1 0 1 1 Light cyan	
0 1 0 0 Red	1 1 0 0 Light red	
0 1 0 1 Magenta	1 1 0 1 Light magenta	
0 1 1 0 Orange	1 1 1 0 Yellow	
0 1 1 1 Light gray	1 1 1 1 White	

**Table 1.** Background and foreground screen colors are generated with different settings of the bits in the attribute byte, as shown here.



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and then type in the following program steps (ignoring any comments after a semicolon). All numbers, by the way, are in hexadecimal –

```
A 100 ;START ASSEMBLING CODE AT ADDRESS 100
MOV BL,7 ;THE ATTRIBUTE BYTE. '7' IS A PLAIN WHITE CHARACTER.
MOV AL,49 ;CHARACTER WILL BE THE LETTER 'I'.
MOV BH,0 ;SELECT DISPLAY PAGE 0
MOV CX,0A ;WILL MAKE IT WRITE 10 LETTER I's
MOV AH,9 ;SELECTS BIOS FUNCTION NO. 9
INT 10 ;DO THE BIOS FUNCTION
MOV AH,0 ;FUNCTION TO TERMINATE PROGRAM
INT 21 ;DO A DOS FUNCTION
(RET) ;CLEAR OUT OF ASSEMBLER
RCX ;INSPECT THE CX REGISTER
11 ;WRITE 11 INTO CX REG (PROG LENGTH, 11h BYTES)
N ATR.COM ;CHOOSE FILE NAME FOR FINISHED PROGRAM
W ;WRITE IT TO DISK
```

– you will now have on your default disk drive, a tiny program called ATR.COM. If you type ATR from the Dos prompt, you should be rewarded with a string of 10 Is on the screen. If you haven't yet left Debug you can type G for GO to get your 10 Is.

Now, to try the effects of different attribute bytes while still in Debug, type 'E 101' and then the hex value of the attribute byte you want to test. It will be patched into the program, and if you then type G you should see the effect of that attribute byte. You will still be in Debug, so you can 'E 101' yet another number, and then 'G' again. You should, of course, take notes of what happens each time, and eventually some kind of pattern will emerge.

In the Toshiba laptops, four types of characters are possible – normal fat, inverse fat, normal skinny, and inverse skinny. Toshiba calls these Modes 1, 2, 3, and 4. Toshiba laptops come with a utility program called Chad.com that lets you assign one of these display modes to each of two different types of attribute bytes, 'color on color' and 'color on black'. Some other laptops have similar programs, so check your manual. Chad.com can make temporary changes via a pop-up window, or it can permanently record your mode preferences in the computer's configuration memory.

Now for some useful facts about how Toshiba handles the color signals from the attribute byte. You will note that Chad refers to a 'color' foreground in both its options. In the attribute byte, if all three foreground color signals (Bits 0, 1, and 2) are on, you don't have color, you have a *white* character. A white foreground (character) doesn't come into Chad's scheme of things, nor does a *black* character – only colored characters do. So, any attribute byte that has its first three bits either all on or all off is totally immune to the effects of Chad.

Fat and skinny characters are the LCD's way of showing 'normal' or 'highlight'. A fat character is a skinny character in which vertical lines have been made two pixels wide instead of one. This is why the letter 'I' was chosen for the experiments, to make fat characters stand out better. Fats and skinnies are available as Chad choices, *except* when the intensity bit, Bit 3, is on. Then *all* characters are forced to skinny size, with either inverse or normal still being determined by Chad.

The action of the intensity bit seems back-to-front somehow. One would think that setting 'intensity' high would cause the production of a more prominent LCD character – in other words, a

*bold* or fat character. Instead, the intensity bit forces them to 'skinny', sort of a low-light effect. On the Toshiba laptops, if you press the Function and the Right-arrow keys together, all skinny characters become fat and fat characters become skinny (too bad it doesn't apply to writers as well). But the effect is only temporary, and whenever you turn the computer off it reverts to its old ways.

This is a most inconvenient state of affairs, because characters that produce a 'highlight' on the LCD come out 'dim' on a CRT screen, and vice versa. I've tried to hack things about to make the Toshiba respond more to my tastes, but so far without success. Oh, and we shouldn't forget about bit 7. Turning it on in an attribute byte will always cause a character to flash on and off, regardless of what Chad has done to it. I usually set up my own software so the error messages flash.

We have now established a few 'out of bounds' areas for Toshiba's Chad character 'fixer-upper'. What's left over are areas where Chad can do what it's designed to do. We know that within an attribute byte, both *black* and *white* foreground values are unaffected. So, for Chad to get a grip on things, at least *one* foreground color must be on, but they can't *all* be on. As for the background colors, Chad's color on black condition is met only if all three background colors (Bits 5, 6, and 7) are off. If any or all background colors are on (note that a white background is OK), we have the color on color condition.

	Backlit	Reflective
Indoors, artificial light	VERY GOOD	POOR
Indoors, natural light	GOOD	FAIR
Outdoors, shade	FAIR	GOOD
Outdoors, sunlight	FAIR	GOOD

**Table 2.** For those considering buying a laptop, this guide shows the conditions each type of screen looks best in.

### Using the information

WITH MY OWN laptop I like to be able to connect a standard amber CRT monitor from time to time, and have my wordprocessors and other programs look nice on the CRT display as well as the laptop's LCD. This takes a little juggling of attribute byte values to get something that stands out clearly on the LCD, while producing a pleasing result on a CRT monitor. It's fiddly, but it can be done.

Say, for the sake of argument, we wanted to set up a wordprocessor so that Chad could show its menus as, say, Mode 2 (skinny inverse). Therefore, a color on black attribute value might be appropriate here. Chad can make it either fat inverse or skinny inverse. One of the legal attribute values, 1 to 6, should look fine on a CRT monitor.

We also need to set up some characteristic for the typed text itself, maybe some 'messages', and perhaps some 'blocked text'





The best choice for the main text work area would probably be an attribute byte value of 7. This would give fat, normal characters, out of the reach of the ravages of Chad. (But the CRT monitor would show dimmed characters for 7.) Messages might be nice with a value of 0Fh, which is 7 with the intensity bit turned on. This would produce skinny characters, out of the reach of Chad, but bright characters on a CRT.

Block-marked text (marked for block moves, and so on) usually looks nice in inverse print, and this could be produced from color on color. Color on color will be met for the blocked text's attribute bytes if, firstly, at least one background bit is on and, secondly, at least one (but not all three) foreground bits are on. Thus, we can now work out some ranges of numerical values. In hex, the first digit from 1 to 7, and the second digit from 1 to 6. That is, 11, 12, 13 ... 16, then 21, 22, 23 ... 26, and so on, right up through 71, 72, 73 ... 76. All of these should satisfy Chad's color on color requirement.

With these legal values in hand (42 of them), we can now connect the CRT monitor and try the values on that. There should be *at least one* that will produce a pleasing 'inverse video' effect, while still meeting Chad's color on color requirement.

It's important to realise that Chad affects the LCD screen only. You can make it pop up on a CRT screen, but changing things with Chad seems to have no effect at all. You would notice the changes if you go back to the LCD screen though.

You will find that some programs ask you to specify a decimal number for the attribute of each type of screen output, and this is easy to work out. You just convert the legal hex values using something like SideKick's calculator. Other programs may show you a 'color chart' with the attributes already applied, and you are asked to select one that looks nice. But the chart will most likely look like a big blue blob on the laptop's screen. You'll probably find, though, that the chart may have 16 positions across and eight or 16 down. If this is the case, you can be pretty sure that each position across represents one hex digit, 0 through F, and each position down represents the second hex digit. You may

have to experiment to find out which is which. Therefore, you can mentally plot where your 'legal' area lies, and select the values accordingly.

Many programs like wordprocessors and spreadsheets have options so you can revert to default values of display attributes if you mess up the installation. This is also possible on an LCD screen, since you could end up making it show all blank characters. If your program doesn't have a 'revert to default' feature, you should certainly store an unmodified version of it away somewhere safe before you start hacking around with its attribute bytes.

### The cursor

ON LAPTOPS, particularly those with reflective screens, the standard flashing underline cursor is usually pretty hard to see. If you send the cursor skittering off across the screen, it can be hard to find again. The cursor is much easier to keep track of if it's a big block rather than just an underline. Here's how to convert whatever your default cursor is into a nice big block cursor. First call up Debug and then type –

```
A 100 ;ASSEMBLE CODE FROM ADDRESS 100
MOV CX,7 ;SET START CURSOR LINE AT 0, END AT 7
MOV AH,1 ;FUNCTION TO SET CURSOR SIZE
INT 10 ;BIOS VIDEO CALL
MOV AH,0 ;FUNCTION TO TERMINATE PROGRAM
INT 21 ;DOS CALL
(RET) ;GET OUT OF THE ASSEMBLER
RCX ;INSPECT CX REGISTER
OB ;SET IT FOR PROGRAM LENGTH OF 0Bh BYTES
N CUR.COM ;THIS IS WHAT WE ARE GOING TO CALL IT
W ;WRITE CURSOR.COM TO THE DEFAULT DISK.
```

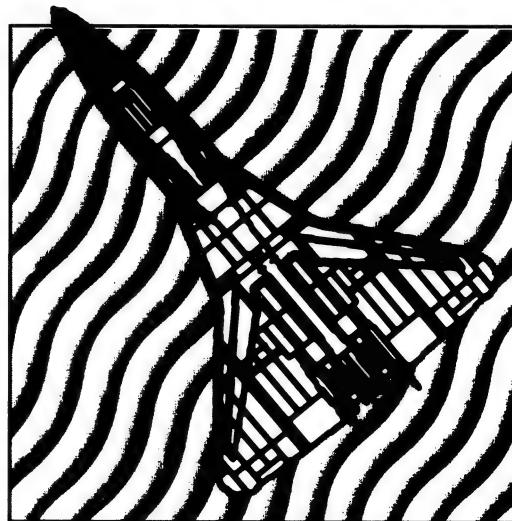
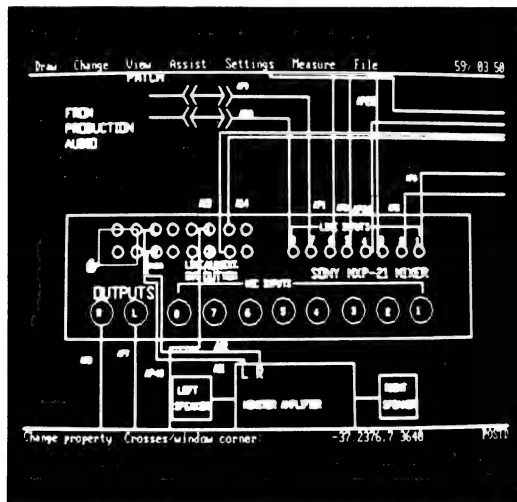
Now exit Debug, and type CUR. You should get a nice big blobby cursor (it's easier to see it on an LCD screen). You can put CUR.COM in your Autoexec.bat file, but it should be the last item. Some other programs (like Turbo Lightning) change the cursor themselves, so you want to be the one to have last go at it. Also, be aware that some wordprocessors change the cursor for their own uses. In that case, tough luck!

I also thought it might be nice to stop the cursor flashing, or at least slow it down. This, you can easily do by directly programming the PC's 6845 video controller chip (there is a special cursor configuring register). The problem with a laptop is that there's no 6845 – there are lots of those new surface-mount chips with completely unknown type numbers, and part of one of them is supposed to emulate a 6845, more or less. Sure enough, in the Toshiba, there was something at the right address that acted like a 6845, more or less. You could program the cursor size without even going through the BIOS. You could even turn the cursor right off. But, the one register bit dedicated to 'blink' didn't seem to exist. So it looks like we're stuck with a flashing cursor on the Toshiba – but experiment with your own laptop, you might be luckier.

Now it's your turn. With a little thought about what's actually happening and mapping out your plans in advance, you should be able to configure just about any software to work well with a laptop LCD screen, while maintaining compatibility with a CRT monitor, even a color one! □



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## ***A Concise Introduction to Lotus 1-2-3***

THE TYPICAL BUSINESS user does not have a lot of time to learn about a new piece of software, even if it will improve productivity in the long run. With this in mind, Noel Kantaris has written *A Concise Introduction to Lotus 1-2-3* (Babani, around \$10) to enable novices to start using versions 2.0 and 2.1 as quickly as possible.

The book gives examples of how to construct and print out spreadsheets, print labels, format numbers, and create graphs. The database possibilities of Lotus are also discussed, including how to set up a database, search it, sort entries, and other useful database operations.

An entire section is devoted to macros, describing how to use them to replace

a sequence of commands which are typed in frequently, in the same way as Dos batch files avoid repetition at the system level. The reader learns how to create macros in an unused section of the worksheet, and (more importantly) how to debug them.

Again, this book is not intended to replace the manual, but to act as an introduction to it and a quick reference for infrequently used commands. The appendices at the back of the book include a summary of all the mode and status indicators which the program uses, macro commands, and @functions.

## ***A Concise Advanced User's Guide to MS-DOS***

THERE HAVE BEEN many books written on the subject of Dos, or more specifically,

Ms-Dos. This is not surprising – it is the most common operating system in the PC world today, which makes it the most commonly used PC program, since it is always there in the background, as an interface between the application software and the machine itself.

The spectrum of available works ranges from beginner's guides through to advanced techniques for more experienced users. *A Concise Advanced User's Guide to MS-DOS* by Noel Kantaris, (Babani, under \$10) as the title suggests, is positioned towards the latter end of the spectrum. It does not endeavor to introduce the reader to Dos, but rather, is a guide to those who are already familiar with the operating system, and want to do something a little unusual.

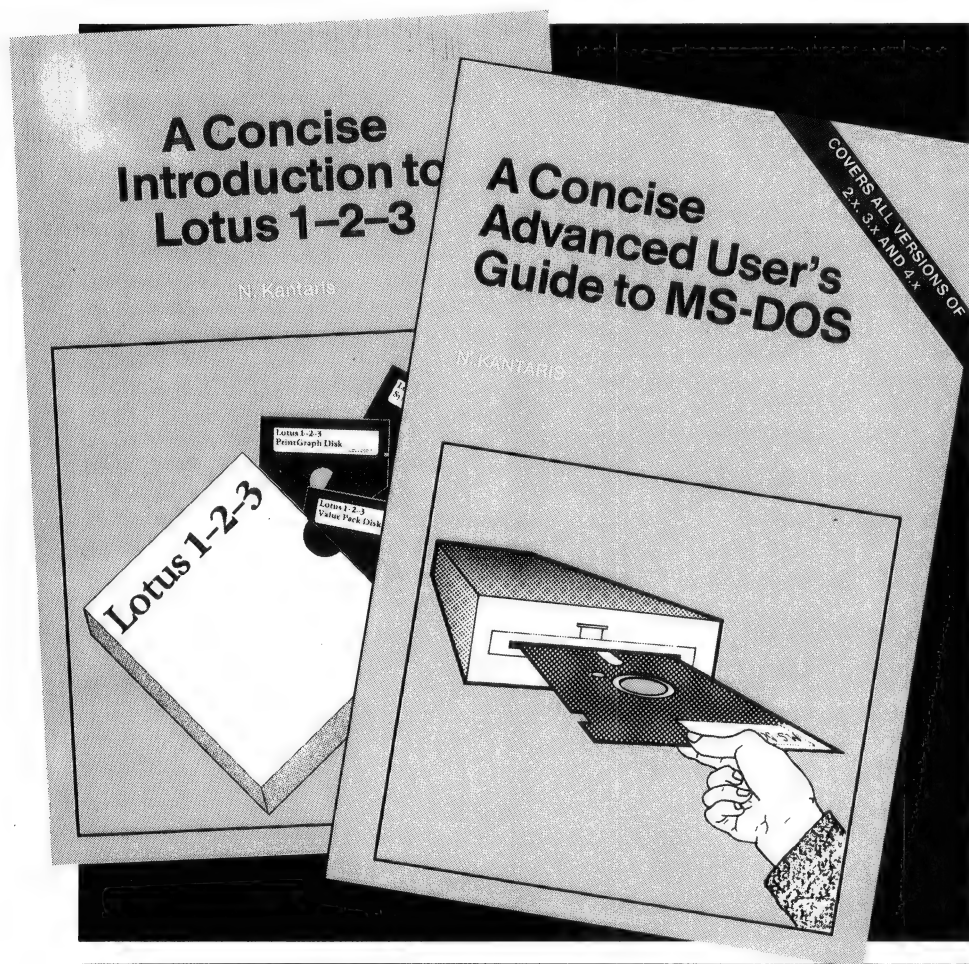
The first section of this book covers the Ansi.sys device driver, and how to use its various features, such as setting screen attributes and defining function keys. The coverage is quite complete, even to the point of describing how to use Edlin to enter the required escape codes into the batch file.

The use of the Debug program is covered next, which makes up for the lack of detail in the Dos manual relating to this extremely useful (some say indispensable) Dos program. This section also includes a discussion of the names and functions of the various CPU registers, and a list of the more common assembler mnemonics, to help in understanding output from Debug's 'unassemble' command.

The final section introduces the reader to writing his or her own machine code, using Debug. This combines an introduction to using machine code commands with the features which Debug for machine language programming.

Included in this section is the list of software interrupt vectors, and a summary of the services which can be accessed through INT 21H, the general-purpose Dos interrupt. Examples of how to write programs to perform simple operations are also included.

For users who want to do a little more with their computer than simply running off-the-shelf applications, this book is a good introduction to the concepts involved. □





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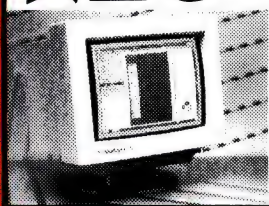
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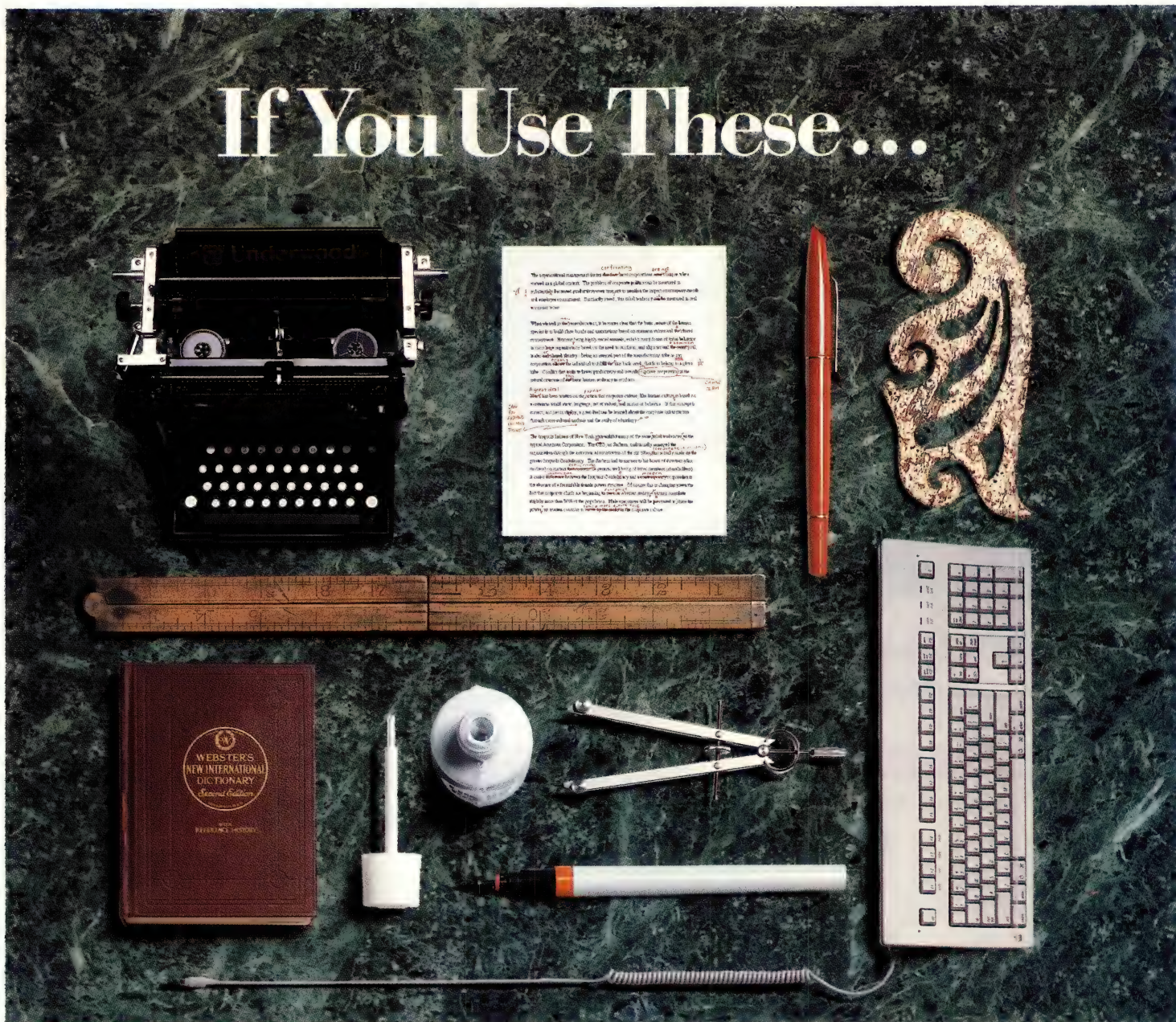
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# What is Shareware... and why is a Directory important?

## How it works

Shareware relies upon the honesty of software users to pay for the software that they use. Shareware bypasses the costs associated with conventional marketing and promotion of software by inviting users of software to give copies of the software to their friends. If the user of the software likes the product and wants to continue to use it in any way then the user should register that software. When a user registers the software the author gets a return for his effort in creating the software and is encouraged to improve the product and to develop new products. Rather than implementing cumbersome copy protection schemes shareware authors do exactly the opposite — they actually encourage their users to make copies of the software for their friends. Word would spread slowly if the author solely relied upon users just sharing copies with their friends. User groups are encouraged to share the software with their members on a non profit basis. Many user groups set up Bulletin Boards so that members can "down load" software which they would like to evaluate for use. This is another accepted way of distributing shareware. Some commercial operations also distribute shareware and charge for the disks. Again this is an accepted way of distributing shareware providing the disk distributor meets certain criteria set down by the authors.

## What is the difference between Shareware and Public Domain Software?

Public Domain software is created by authors who chose not to seek formal rights or royalties. There is no restriction of any kind on distribution of this kind of software. Most public domain software is games or utilities. There are very few complete products in the public domain. Shareware software on the other hand is distributed so the user can evaluate the software to decide whether he will register with the author and continue to use the software. Shareware is an alternate method of marketing software, not really a different kind of software. In fact the more successful Shareware products hold their own against their commercially distributed competitors. The greatest difference is that the Shareware product's packaging is not as fancy and the price is much lower.

## Where can I obtain Shareware trial disks?

A collection of Shareware disks is usually referred to as a Library. A Library may be kept by a user group, a bulletin board operator or by a commercial diskette distributor. A lot has been said and written about viruses. There is no doubt that a virus could be distributed hidden in a public domain or shareware disk. Care needs to be taken that the library you use for disks takes every reasonable step to eliminate the possibility of a virus. Careful checking is not sufficient as it is simply impossible to check every single disk to the degree which would be required. The safest way for your library to obtain Shareware disks is to source them directly from the authors. This of course means that the source of every disk is known and the insidious perpetrator of a virus cannot hide behind a cloak of anonymity. The Shareware authors are always releasing new versions of their software and you should ensure that the library is kept up to date with the latest available versions. Before you purchase any disks you should ask if the software and the latest versions are sourced directly from the authors. If the answer is "yes" you can be reasonably sure that you are getting the latest versions and that they should be quite safe to use.

## Do I need to join a Library?

Some commercial libraries and most user groups insist that you join before you can purchase disks. If you intend to purchase disks a properly prepared catalogue will make your selections easier and repay your membership costs many times over.

Other libraries allow purchases without any membership fees and some offer a free catalogue. The free catalogue is usually a very short description of available disks and is often given away as an insert in magazines. Of course there is no such thing as a free lunch — the brief descriptions in free catalogues mean that you will invariably purchase more disks than you really need. The descriptions are so short you really are taking a lucky dip!

## What is PC-SIG?

PC-SIG is the world's largest Shareware library and contains around 1500 disks. PC-SIG does not require you to become a member to purchase disks and gives you a choice of Directories to suit your requirements.

PC-SIG are the publishers of a bi-monthly magazine, appropriately named "Shareware". The magazine lists new additions, upgrades to existing disks and compares products from different authors. "Shareware" is available at many newsagents in Australia at around \$4.50 an issue or on a twelve month subscription basis for \$20. Subscribers to "Shareware" also receive FREE a 48 page mini catalogue of the PC-SIG Library.

NEW from PC-SIG is the definitive reference work for tracking down the Shareware product you need. With nearly 500 pages of detailed descriptions of the programs in the PC-SIG Library "The Complete Encyclopedia of Shareware" provides a wealth of carefully organised information to help you find the product you are seeking. You can look up a program by subject category, title or disk number. There are even handy "see also" notations to direct you to other programs which may suit. The Encyclopedia is exceptional value at just \$32.50 (plus \$5 post and handling).

If you chose to subscribe to "Shareware" and to purchase "The Encyclopedia" you can become a member of the Library for just \$38 (plus \$5 post and handling). You will not only have the best reference work available but be kept up to date for a full 12 months with "Shareware" magazine. As a further bonus members are offered special discounts from time to time.

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Libraries often represent that they offer PC-SIG disks BUT unless the disks are grey and carry PC-SIG's logo they are not genuine PC-SIG disks. PC-SIG cannot take any responsibility or offer support nor the money back guarantee on such disks. Invariably these libraries do not bother updating to the latest version at all, or at best they will update from time to time so they can claim that they do update.

To ensure that the library contains the best quality products no disk is added to the PC-SIG Library unless it is obtained directly from the author. There can be no anonymous interference with PC-SIG disks!

## Are registered Shareware copies available in Australia?

PC-SIG's distributor in Australia, Manacomm, offers the full PC-SIG library and also has arrangements with many Shareware authors to represent them in Australia. Yes, the complete registered packages with manuals and access to upgrades are available right here in Australia. If you return the PC-SIG Shareware disk when investing in a registered copy you will be refunded \$5 per disk.

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# ANTI-TRIBOELECTRICITY MATS

MELBOURNE-BASED DSC Management Pty Ltd has developed a polymeric anti-static mat which has the potential to replace many million dollars of imports annually, and to generate export income. The new product has been in field and laboratory test for the past six months, and the company has now completed its first commercial run of the final formulation.

Triboelectricity, or 'static', is a major cause of computer and electronic equipment malfunction and Australia currently imports annually between \$10 and \$20 million worth of overseas manufactured mat products for use in computer rooms and key workstation areas.

Today's computer circuitry works on millivolts of electrical flow, but an operator can inadvertently transmit up to 2000 volts in a static charge created by clothing or carpet friction, or conducted from a positively charged low humidity atmosphere. The final formulations for the DSC mats were developed under grants from the Telecom Development Fund and tested in the Telecom and the Hale laboratories earlier this year. According to DSC Managing Director Stan McTighe, his company's formulation has truer 'anti-static' properties than older formulations being imported.

'Until recent times the test for an anti-static formulation was its ability to disperse an electric charge without worrying about whether it could be an active factor in charge generation. However it has been found that many of these anti-static products can exacerbate the problem rather than solve it,' he warned.

'For example, laboratory testing has shown that some carbon loaded 'poly' gloves sold as an anti-static solution are only effective when used to handle copper and steel. When used to handle quartz, wool, glass or polyester the gloves can generate charges as high as 2000 volts.

Melbourne-based DSC Management has developed a new mat to guard against static (triboelectricity) – it has the potential to save Australia millions of dollars in imports.



*Laboratory testing has shown that some carbon loaded 'poly' gloves sold as an anti-static solution are only effective when used to handle copper and steel. When used to handle quartz, wool, glass or polyester, the gloves can generate charges as high as 2000 volts – DSC Management's Stan Tighe.*

'This is a highly dangerous combination when someone is handling or working with computer equipment. However, most managers who had supplied the gloves would be slow to isolate this as a cause, believing they had already avoided the problem in the first place,' he added.

McTighe said that triboelectric problems needed to be tackled on a number of fronts to be successful. The first was to reduce the triboelectric environment. This could be done partially through creating a neutrally charged atmosphere, and eliminating or treating carpets. 'However, it is difficult to insist that one's staff work only partially clothed and that no static-emitting equipment, such as computer screens, be allowed in the room, and still have an efficient operation,' McTighe said with a smile.

Certainly, businesses needed rules about allowing staff to touch electronic storage media such as disks or tapes without first grounding themselves, and being properly grounded during the operation.

The DSC Management mats had been designed to put an operator in an environment where any charge build-up was continually dissipated before it could reach levels dangerous to equipment or painful to the operator.

The Australian made mats for floor and desks incorporated an earth (grounding) lead incorporating a resistor which controlled the rate of discharge. The company also supplied a further option of a wrist strap ground lead for operations working in high risk areas such as electronic assembly operations.

DSC Management is a five-year-old Melbourne company specialising in ergonomic and safety products for the computer environment. It also manufactures specially designed document holders, the Relax-a-wrist keyboard support, printer and monitor stands, and mouse mats. And, all these products are designed and manufactured in Australia. □





LARRY  
LEWIS

## Twit users

**T**HE RESPONSE TO the archive program offer in January's column has been overwhelming. My poor better half (or is it 90 per cent?) has been copying disks, labeling mailers and sticking stamps like crazy ever since!

If you have not requested your copy yet, the offer is still open – send \$10 (no cash!) to: *The Prophet*, PO Box E41, Emerton 2770 NSW for the file compression tools mentioned in January. You need to tell me what format your machine uses: high or low density, 3.5- or 5.25-inch disks. Note the programs are all Shareware, so if you are going to use them, you'll need to comply with the various user licenses. It would seem that more people than I ever thought possible do not have access to the utilities like these.

Back in November, 1988, I mentioned that some people were thinking that Bulletin Boards had reached saturation point. There were then about 100 systems registered in the Sydney (02) area. Now there are just over 120 systems – a 20 per cent increase. Does this mean that things are going to get bad for users or boards? I don't think so, not for quite a long time yet. When will it end? Probably only when just about everyone that has a modem has run their own board and shut it down after a week.

### User twits

JUST TO BE FAIR, after last month's 'SysOp Twits' comments, it's only fair to give you the other side. This is a potpourri of quotes from various places, mainly from the Metro Shareware BBS in the US (pinched from Ken Thompson's Black Hole BBS) –

Twits love *downloading*. Uploading is for simpletons who can't tell whether they are coming or going. If Twits designed modems, we'd all have one which downloads at 18.2kbps, and uploads at 300kbps. If Twits wrote protocols, the smallest block they could receive would be 10Mb.

Twits can't *read* or *count*. This is evidenced by their total inability to comprehend System Rules, or Upload/Download Ratios. But, for some strange reason, they can still use a computer.

Because of this handicap, most Twits are unemployed. It's a miracle that most of them haven't been retained by the state to pick up trash on the freeways. They'd gladly volunteer for it, if it could be done with a modem and they were called 'remote-trash downloaders'.

Twits feel that the proper way to leave a board is to drop the carrier. They do this because they don't want to waste their valuable time exiting via the 'goodbye' command, when they could spend that time calling another board.

Twits *never* leave messages, unless it is rude, crude, or socially unacceptable. If an exception to this exists, it will probably be a creative one-liner such as 'Hi!!!!!!!!!!!!!!'. And, they rarely reply to messages.

They *never* communicate with SysOps, unless it is to ask *why* such and such file is unavailable, demand access to the 'pirate-board', or gripe about something. Mail from the SysOp is considered to be the electronic equivalent of 'junk-mail', and should be ignored. In fact, there should be some form of law to stop it from being written.

Twits *never* pay for access to a computer system. They see themselves as latter-day Robin Hoods, taking from the rich (SysOps) and giving to the poor (themselves). Their motto is: 'If it isn't free, it isn't worth having.'

Twits *need* multiple log-on codes. This is the measure of their 'Twit-dom', and reflects their true status in the 'Twit community. A Twit with only *one* log-on code is a *failure*, and faces censure and possible expulsion from their peer group. (It is no wonder that Twits exhibit schizo-tendencies).

### Complete BBS Registry Listing

WE PUBLISH THE COMPLETE listing for the ACT and New South Wales in July, October, January and April; the listing for Victoria, Tasmania and the Northern Territory in August, November, February and May; and South Australia, Western Australia and Queensland in September, December, June and March.

Registration of Bulletin Boards are only accepted electronically at the primary electronic collection points – please address all enquiries through them.

### Know-it-alls

TWITS KNOW *EVERYTHING*. Just ask them. But, it would take a crow-bar and dynamite to get any useful information out of them. These self-professed 'experts' will *rarely* stoop so low as to assist someone who may genuinely need some help. After all, a *real* 'hacker' never needs or asks for help.

A Twit would not be caught dead using their *real name* when calling a BBS. In fact, they refuse to leave anything more involved than a handle when registering.

The *only* exception to this rule is that they will often use *someone else's* real name. Or, they may use the name of a heavy metal rock group (imagine a system where everyone is named Guns 'n Roses).

Twits *never* register their Shareware; cash is what they use to buy faster modems. Program authors are neurotic-compulsives, and if they did not serve a purpose, Twits would have them abolished completely.

Twits *adore* Sprint, MCI, and other long-distance credit card numbers, *if* they belong to someone else. This also applies to Compuserve, Source, and so on. Their motto is 'If you can't steal it, it can't be much fun'.

A Twit is a 'BBS connoisseur'. They *know* how your system *should* look and run. They will not hesitate to inform you if it fails to meet their demanding and rigid expectations. (They consider this a 'public service'). However, they would *never* trouble themselves to run their *own* BBS – that might take valuable time away from their duties as 'remotes' on the 30 or more systems they spend all their waking moments calling.

Twits love to page the SysOp, often just for the sheer hell of it.



## NATIONAL BBS LISTING

They are most fond of 'late night' paging. This is the perfect time for them to explain the infallible logic as to why they should be given Remote-SysOp access to your system. Their second most favorite reason for wanting to chat is 'Just checking to see if you were there!'

They cannot comprehend *why* the IBM program they just downloaded won't run on their Atari 800. After all, programs are programs, right? And, any fool knows that a 32K machine can hold a 200K program.

Twits can't tolerate seeing a command that they can't use. Their motto is 'try, try again'. If it didn't work the first time, it *has* to work on the second, third, or fourth time. No self-respecting SysOp would intentionally offer them anything less than total access.

They are fascinated by Dos. Their quest for it rivals the search for the legendary Holy Grail. They *must* reach it, through their modem, or all is lost. What they would do with it if they reached it, is probably a lot like what a dog who chases cars would do with one if he managed to catch it ...

Twits are also totally engrossed by hardware. They can conceive the most unorthodox, outrageous, and potentially lethal contraptions known on earth. Occasionally, these 'time-bombs' actually work. Any difficulties they experience with their computers will fall under the heading of 'miscegenation', or 'poetic justice'.

They crave the latest version of Goober-Pods, or Space-Weenies. To reward the SysOp for access to such megabyte gems, they will upload valuable and useful programs in return, such as

Weasel-Stompers for the Commodore-64, providing it is less than 10K in size.

A Twit *never* uses applications programs, and *never* writes programs. (Programs are what Twits download, and most can just barely write or spell). Their motto here is 'If you don't need a joystick to play it, it isn't worth having'.

A real Twit will flatly refuse to use *any* compression method on files they intend to upload. After all, SysOps sit and twiddle their thumbs waiting on something to do, and should be grateful that they get any uploads! They also refuse to upload documentation.

They suffer if there are no 'new' files on the system. There may be a correlation between 'new' files and Twits, much as there is one which exists between dog-excrement and flies. The only difference is that flies usually leave after eating their fill, however, Twits don't.

They desperately need to become Remote-SysOps. They know that everyone else on the system has SysOp capabilities, and don't want to be excluded from all the fun! (Are all Twits created equal?)

Twits think that the Caps Lock key must be activated in order to properly leave a message on a board, and that their message is of such great importance that it must be screamed at everyone.

Occasionally, an above average Twit who discovers that modeming can be a two-way street will attempt to get around upload/download ratios by renaming the same program fifteen or twenty times and using it to fill the SysOp's hard disk. After all, rules were meant to be broken, right? □

### Primary electronic collection points

**ACT** - PC Exchange RIBM  
(062) 58 1406

**NSW** - Prophet TBBS  
(02) 628 5222

**Vic.** - Custom Programming  
Opus (03) 848 3331

**Qld.** - AMPAK Opus/PRBBS  
(07) 263 7070

**SA** - Oracle PC-Network  
(08) 260 6222

**WA** - Nemo Multiple BBS  
RAPL (09) 370 1855

**Tas.** - Hobart Users Bulletin  
Board (002) 43 5041

### BBS Listing 9002

**Sun 4 Feb 1990**

New systems: 23  
Online: 6  
Unknown: 5  
Offline: 11  
Name Change: 3  
Amended: 24  
Total Systems: 407

### AUSTRALIAN

#### CAPITAL TERRITORY

##### COLD FUSION BBS

Sysop: Axel Smith  
Phone: (062) 95-0344  
Baud: V21 V22 V23  
Access: Reg  
Hours: Daily: 2200 - 0800 Weekdays:  
0900 - 1600  
Computer: IBM Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

##### Ghost of Opus

Sysop: Scott Furry  
Phone: (062) 58-7160  
FIDOnet: 3:620/240  
Baud: V21 V22 V22bis B103 B212  
Access: Public  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

##### MICSIG Fido

Phone: (062) 85-1026  
Baud: V21 V22 V22bis V23  
Access: Public  
BBSSoftware: Fido

##### PC Exchange Opus

Sysop: Phil Harding  
Phone: (062) 58-1406  
FIDOnet: 3:620/244  
Baud: V21 V22 V22bis V23  
Access: Mem LVA

##### PCUG Bulletin Board

Sysop: Alan Salmon

Phone: (062) 59-1244  
FIDOnet: 3:620/243  
Baud: V21 V22 V22bis V23 PEP  
Access: Mem LVA  
Computer: IBM AT  
DOS: PC DOS  
BBSSoftware: Opus

##### Percom BBS

Sysop: Alex Reutt  
Phone: (062) 81-3119  
FIDOnet: 3:620/247  
Baud: V21 V22  
Access: Public  
Hours: Daily: 2100 - 0700  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: Opus

##### The Capital BBS (CUG [ACT] Inc.)

Sysop: Basil Chupin  
Phone: (062) 81-0847  
FIDOnet: 3:620/241  
Baud: V21 V22 V22bis V23  
Access: Mem LVA  
BBSSoftware: Lynx

##### 500cc Formula One Amiga BBS

Sysop: Dino  
Phone: (02) 550-6858  
FIDOnet: 3:712/218  
Baud: V21 V22 V22bis V23 B103  
B212  
Access: Reg  
Computer: Amiga 2000  
DOS: AmigaDOS  
BBSSoftware: BBS-PC!

##### A Southern Rendezvous

Sysop: Kevin Withnall  
Phone: (042) 26-3382  
FIDOnet: 3:712/206  
Baud: V21 V22 V22bis V23  
Access: Mem LVA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: Opus

##### ABCOM-dataLINK

Sysop: Ben Sharif  
Phone: (047) 36-4165  
FIDOnet: 3:713/304  
Baud: V21 V22 V22bis V23  
Access: Mem Reg VA  
Computer: IBM AT Clone  
DOS: PC DOS  
BBSSoftware: QuickBBS

##### ACE BBS

Sysop: Adrew Davies  
Phone: (02) 664-1303  
Baud: V21 V22 V22bis V23 B103  
B212  
Access: Mem LVA  
Computer: Atari 520 ST  
DOS: TOS

### NEW SOUTH WALES

##### 2000 and Beyond QuickBBS

Sysop: Greg Kuhnert  
Phone: (02) 544-7123  
FIDOnet: 3:712/513  
Baud: V21 V22 V22bis V23 B212  
Access: Mem Reg LVA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS



# NATIONAL BBS LISTING

**BBSSoftware:** QuickBBS ST

## **Aftermath BBS**

**Sysop:** Ron & Andrew Clark  
**Phone:** (02) 872-5520  
**FIDOnet:** 3:711/804  
**Baud:** V21 V22 V22bis V23 B103 B212  
**Access:** Mem VA  
**Computer:** IBM AT Clone  
**DOS:** MS DOS  
**BBSSoftware:** RemoteAccess

## **AmigaMan**

**Sysop:** Ron Carruthers  
**Phone:** (047) 58-8006  
**Baud:** V21 V22 V22bis V23  
**Access:** Mem Reg LVA  
**Computer:** Amiga 1000  
**DOS:** AmigaDOS  
**BBSSoftware:** BBS-PC!

## **Amstrad ABBS**

**Sysop:** Riccay Schmahl  
**Phone:** (02) 981-2966  
**Baud:** V21 V22 V22bis V23  
**Access:** Reg VA  
**Computer:** IBM 386 Clone  
**DOS:** MS DOS  
**BBSSoftware:** Opus

## **Apolloine Australia BBS**

**Sysop:** Richard Heppell  
**Phone:** (02) 869-8349  
**Baud:** V21 V22 V22bis  
**Access:** Mem Reg LVA  
**Computer:** IBM AT Clone  
**DOS:** MS DOS  
**BBSSoftware:** Searchlight

## **Apple Users Group - Apple // BBS**

**Sysop:** Cameron Brawn  
**Phone:** (02) 449-7798  
**Baud:** V21 V22 V22bis V23  
**Access:** Mem LVA  
**Computer:** Apple //e  
**DOS:** ProDOS  
**BBSSoftware:** Proboard //

## **Arrow KBBS**

**Sysop:** Mark Sinclair  
**Phone:** (02) 451-2660  
**Baud:** V21 V22 V23 B103 B212  
**Access:** Mem Reg VA  
**Computer:** C-64  
**BBSSoftware:** KBBS

## **Atari ST Users Club**

**Sysop:** Andrew Brown  
**Phone:** (02) 709-4038  
**FIDOnet:** 3:713/604  
**Baud:** V21 V22 V22bis V23  
**Access:** Public  
**Hours:** Weekdays: 1900 - 0700Weekends: 24 Hours  
**Computer:** IBM PS/2  
**DOS:** MS DOS  
**BBSSoftware:** Minihost

## **Atlantis**

**Sysop:** Brett Selwood & Mark Farnan  
**Phone:** (02) 534-6944  
**FIDOnet:** 3:712/504  
**Baud:** V21 V22 V22bis V23 PEP  
**Access:** Mem Reg LVA  
**Computer:** IBM AT Clone

**DOS:** MS DOS

**BBSSoftware:** Opus / QuickBBS

## **AUG\*MAC\*BBS**

**Sysop:** Richard Kempe  
**Phone:** (02) 439-6142  
**Baud:** V21 V22 V22bis V23  
**Access:** Mem LVA  
**Computer:** Macintosh  
**DOS:** HFS  
**BBSSoftware:** Red Ryder Host

## **AUGUR TBBS**

**Sysop:** Mark James  
**Phone:** (02) 311-3052  
**FIDOnet:** 3:712/302  
**Baud:** V22 V22bis V23 V32  
**Access:** Reg VA  
**Computer:** IBM XT Clone  
**DOS:** PC DOS  
**BBSSoftware:** TBBS

## **Australian Pick User's BBS**

**Sysop:** Kurt Johannessen  
**Phone:** (02) 631-8603  
**FIDOnet:** 3:713/610  
**Baud:** V21 V22 V22bis HST  
**Access:** Reg VA  
**Computer:** IBM XT Clone  
**DOS:** MS DOS  
**BBSSoftware:** PCBoard

## **Avalon BBS**

**Sysop:** Lance Lyon  
**Phone:** (02) 319-1793  
**FIDOnet:** 3:712/313  
**Baud:** V21 V22 V22bis V23  
**Access:** Public  
**Computer:** IBM XT Clone  
**DOS:** PC DOS  
**BBSSoftware:** QuickBBS

## **Beauford BBS**

**Sysop:** Roger Cooper  
**Phone:** (047) 58-6542  
**Baud:** V21 V22 V22bis V23  
**Access:** Public  
**Computer:** IBM XT Clone  
**BBSSoftware:** QuickBBS

## **Bill's BBS**

**Sysop:** Bill Mastro  
**Phone:** (049) 45-9166  
**Baud:** V21 V22 V23  
**Access:** Reg  
**Computer:** Apple //e Clone  
**DOS:** ProDOS  
**BBSSoftware:** GBBS Pro

## **Bit-Board**

**Sysop:** John Hamill  
**Phone:** (02) 411-6375  
**FIDOnet:** 3:711/404  
**Baud:** V21 V22 V22bis V23  
**Access:** Public  
**Computer:** Everex AT  
**DOS:** MS DOS  
**BBSSoftware:** Opus

## **Blackboard BBS**

**Sysop:** Will Black & Shane Andersen  
**Phone:** (02) 692-9149  
**Baud:** V21 V22 V22bis V23 B103 B212  
**Access:** Reg VA  
**Computer:** IBM XT Clone  
**DOS:** MS DOS

**BBSSoftware:** QuickBBS

## **Books BBS**

**Sysop:** Jon Ruwolt & Chris Ruwoldt  
**Phone:** (02) 281-4791  
**Baud:** V21 V22 V22bis V23  
**Computer:** IBM XT Clone  
**DOS:** MS DOS  
**BBSSoftware:** Opus

**Access:** Mem VA  
**Computer:** TRS80 Model 4  
**DOS:** LDOS

## **Coastal BBS**

**Sysop:** Kevin Mann  
**Phone:** (043) 23-2275  
**FIDOnet:** 3:711/430  
**Baud:** V22 V22bis PEP

---

*If Twits designed modems, we'd all have one which downloads at 18.2kbps, and uploads at 300kbps.*

---

## **Buzzards Haven**

**Sysop:** The Buzzard  
**Phone:** (067) 72-1438  
**Baud:** V21 V22 V22bis V23  
**Access:** LVA  
**Computer:** Apple //e  
**DOS:** PRODOS  
**BBSSoftware:** GBBS PRO

## **Cavity**

**Sysop:** Don Cunningham  
**Phone:** (02) 606-9687  
**FIDOnet:** 3:713/611  
**Baud:** V21 V22 V22bis  
**Access:** Mem Reg VA  
**Computer:** Profound XT Turbo  
**DOS:** MS DOS  
**BBSSoftware:** QuickBBS

## **Classic BBS**

**Sysop:** Tony Edward  
**Phone:** (02) 489-7997  
**FIDOnet:** 3:711/505  
**Baud:** V21 V22 V22bis B103 B212  
**Access:** Public  
**Computer:** IBM XT  
**DOS:** MS DOS  
**BBSSoftware:** Opus

## **Club Amiga BBS**

**Sysop:** Ross Kellaway  
**Phone:** (02) 521-6338  
**FIDOnet:** 3:712/511  
**Baud:** V21 V22 V22bis V23  
**Access:** Mem VA  
**Computer:** IBM XT Clone  
**DOS:** MS DOS  
**BBSSoftware:** QuickBBS

## **Club Mac Remote Maccess System**

**Sysop:** Ian MacPherson  
**Phone:** (02) 906-3455  
**Baud:** V22 V22bis V23  
**Access:** Mem LVA  
**Computer:** Macintosh  
**DOS:** HFS  
**BBSSoftware:** Red Ryder Host

## **Club-80 RTRS**

**Sysop:** Michael Cooper  
**Phone:** (02) 332-2494  
**Baud:** V21 V22 V22bis V23 B103 B212

**Access:** Public  
**Computer:** IBM AT Clone  
**DOS:** MS DOS  
**BBSSoftware:** Opus

## **Coastal Communications**

**Sysop:** Chris Patten  
**Phone:** (02) 977-6869  
**FIDOnet:** 3:714/906  
**Baud:** V21 V22 V22bis V23  
**Access:** Mem LVA  
**Computer:** IBM AT Clone  
**DOS:** MS DOS  
**BBSSoftware:** QuickBBS

## **Comet C-64 BBS**

**Sysop:** Eric Davis  
**Phone:** (02) 599-7342  
**Baud:** V21 V23  
**Access:** Mem VA  
**Computer:** C-64  
**BBSSoftware:** Comet  
**Note:** Requires UltraTerm or Pal-ette on C-64

## **Commodore Amiga BBS**

**Sysop:** Paul Bourke and Graham Lee  
**Phone:** (02) 664-2334  
**FIDOnet:** 3:712/629  
**Baud:** V21 V22 V22bis V23 B103 B212  
**Access:** Mem Reg VA  
**Computer:** IBM XT Clone  
**DOS:** MS DOS  
**BBSSoftware:** QuickBBS

## **Commodore Pursuit TBBS**

**Sysop:** Warren Hillsdon  
**Phone:** (02) 522-9144  
**FIDOnet:** 3:712/512  
**Baud:** V21 V22 V22bis V23 B212  
**Access:** Reg LVA  
**Computer:** IBM AT Clone  
**DOS:** MS DOS  
**BBSSoftware:** TBBS

## **Communication 2000**

**Sysop:** Ian Mason  
**Phone:** (049) 59-2664  
**FIDOnet:** 3:711/495  
**Baud:** V21 V22 V22bis V23  
**Access:** Public  
**Computer:** IBM XT



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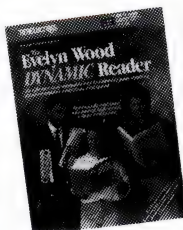
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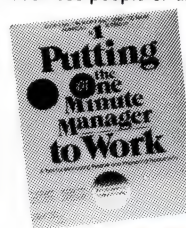


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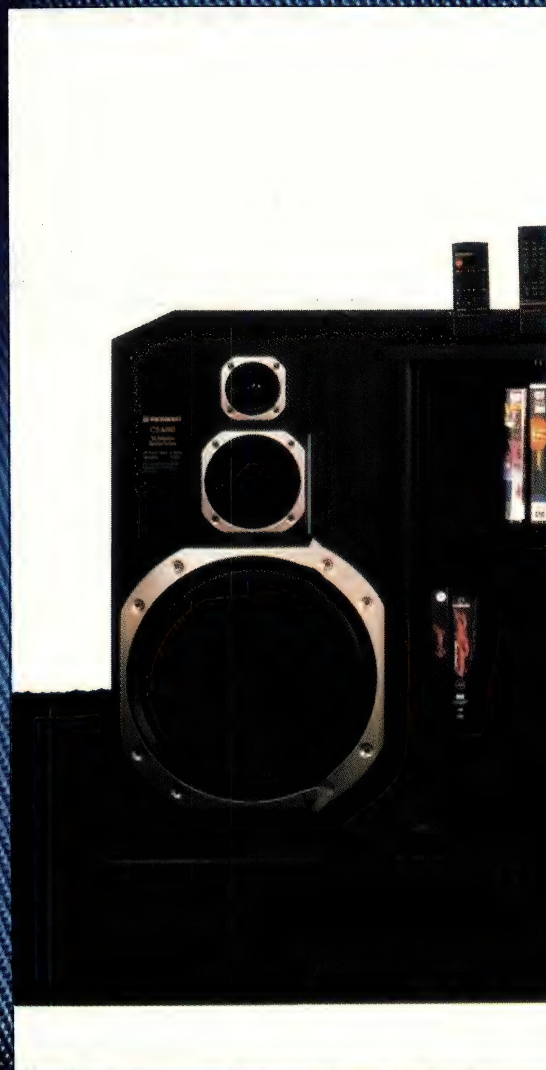
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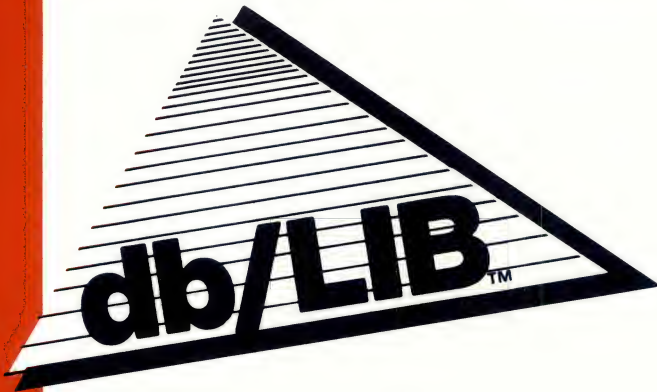


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## THE COMPUTER FACTORY

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FAX: (02) 938-4287



# NATIONAL BBS LISTING

DOS: MS DOS  
BBSSoftware: QuickBBS

## Compax Computers

Sysop: Alex Sardo  
Phone: (02) 890-1059  
FIDOnet: 3:713/601  
Baud: V21 V22 V22bis V23  
Access: Mem LVA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: Opus

## Computrol

Sysop: Bob Spence  
Phone: (02) 489-6848  
GTnet: 302/004  
Baud: V22 V22bis B212  
Access: Mem Reg VA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: GTPower

## Conquest BBS

Sysop: Andrew Fryer  
Phone: (02) 899-4093  
Baud: V21 V22 V23  
Access: Public  
Computer: C-64  
BBSSoftware: KBBS

## Daylight BBS

Sysop: Mark Sefein  
Phone: (02) 548-1429  
Baud: V21 V22 V22bis V23 B212  
Access: Mem Reg VA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## DefCom BBS

Sysop: Iere Lawrence  
Phone: (02) 764-3949  
Baud: V21 V22 V22bis  
Access: Public  
Hours: Daily: 2100 - 0800  
Computer: Atari 1040ST  
DOS: TOS  
BBSSoftware: QuickBBS/ST

## Delta Net

Sysop: Geoff Arthur  
Phone: (02) 457-8281  
FIDOnet: 3:711/415  
Baud: V21 V22 V22bis V23 B103 B212  
Access: Reg LVA  
Computer: IBM 386 Clone  
DOS: PC DOS  
BBSSoftware: QuickBBS

## Dick Smith Electronics BBS

Phone: (02) 887-2276  
Baud: V21 V22  
Access: Reg  
Computer: Multitech PC-500  
DOS: MS DOS  
BBSSoftware: Opus

## Display Systems Australia BBS

Sysop: Michael Butler  
Phone: (02) 317-4937  
FIDOnet: 3:712/515  
Baud: V21 V22 V22bis B103 B212 PEP  
Access: Reg VA

Computer: IBM PC/XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## Down Under KBBS

Sysop: Glen Myles  
Phone: (02) 674-6647  
Baud: V21  
Access: Mem VA  
Computer: C-64  
BBSSoftware: KBBS

## Eagle One BBS

Sysop: Terry Harvey  
Phone: (02) 745-3190  
FIDOnet: 3:712/704  
Baud: V21 V22 V22bis PEP  
Access: Mem Reg VA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: Opus

## Eagle's Nest BBS

Sysop: Philip Dean  
Phone: (02) 451-0535  
FIDOnet: 3:714/409  
Baud: V22 V22bis B103 B212  
Access: Mem Reg VA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## Easy Access GBBS

Sysop: -=\*The Virus\*=-  
Phone: (046) 28-5114  
Baud: V21 V22 V22bis V23  
Computer: Apple //e  
DOS: ProDOS  
BBSSoftware: GBBS

## Eden

Sysop: David Luong  
Phone: (02) 699-9342  
FIDOnet: 3:712/631  
Baud: V22 V22bis B212  
Access: Reg VA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: Opus

## Food For Thought

Sysop: Steve Thompson  
Phone: (02) 683-6093  
GTnet: 302/006  
Baud: V21 V22 V22bis V23  
Access: Public  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: GTPower

## GALEN BBS

Sysop: Paul Purvis  
Phone: (02) 680-4897  
FIDOnet: 3:713/609  
Baud: V21 V22 V22bis V23  
Access: Reg VA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## Helping Hand

Sysop: Dave Hatch  
Phone: (02) 872-3571  
FIDOnet: 3:711/807  
Baud: V22 V22bis PEP  
Access: Reg VA

Computer: AT Clone  
DOS: PC DOS  
BBSSoftware: Opus

## HighTech

Sysop: Ross Wheeler  
Phone: (060) 40-1911  
FIDOnet: 3:712/201  
Baud: V21 V22 V22bis V23 B103 B212 PEP  
Access: Reg LVA  
Computer: IBM AT Clone  
DOS: PC DOS  
BBSSoftware: Opus

## Home Computing

Sysop: David Woodbridge  
Phone: (02) 455-1806  
GTnet: 302/011  
Baud: V21 V22 V22bis V23 B103 B212  
Access: Reg VA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: GTPower

## HomeGrown QuickBBS

Sysop: David Heaps  
Phone: (02) 502-4307  
FIDOnet: 3:712/214  
Baud: V21 V22 V22bis V23 B103 B212  
Access: Public  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## Hot-Line

Sysop: Nick Harvey  
Phone: (02) 488-9375  
Baud: V21 V22 V22bis  
Access: Public  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: GTPower

## Hunter Schools' BBS

Sysop: Matthew Taylor  
Phone: (049) 69-2851  
FIDOnet: 3:711/493  
Baud: V21 V22 V22bis V23  
Access: Public  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## Illawarra BBS

Sysop: John Simon  
Phone: (042) 61-8230  
FIDOnet: 3:712/518  
Baud: V21 V22 V22bis V23 B103 B212  
Access: Reg VA  
Computer: XT Clone  
BBSSoftware: Opus

## Imagineering BBS

Sysop: Chris Moran  
Phone: (02) 697-8599  
FIDOnet: 3:712/626  
Baud: V21 V22 V22bis V23 B103 B212  
Access: Reg LVA  
Computer: Ultra AT  
DOS: MS DOS  
BBSSoftware: Opus

## Integra TEX

Sysop: Kevin Leong  
Phone: (02) 746-1109  
FIDOnet: 3:712/703  
Baud: V21 V22 V22bis V23  
Access: Public  
Computer: IBM AT Clone  
DOS: PC DOS  
BBSSoftware: QuickBBS

## Inter City BBS

Sysop: Jodi Jackson  
Phone: (02) 319-0925  
FIDOnet: 3:712/208  
Baud: V21 V22 V22bis  
Access: Reg LVA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: RemoteAccess

## Intersoft BBS

Sysop: Craig Heading  
Phone: (063) 72-3403  
FIDOnet: 3:711/411  
Baud: V21 V22 V22bis V32  
Access: Mem Reg LVA  
Computer: Tandy 3000  
DOS: MS DOS  
BBSSoftware: Opus

## K.K.K BBS

Sysop: Jim Lynch  
Phone: (02) 418-6005  
FIDOnet: 3:711/416  
Baud: V21 V22 V22bis V23  
Access: Reg  
BBSSoftware: TBBS

## Kangaroo Komer

Sysop: Stephen de Plater  
Phone: (02) 977-2013  
GTnet: 302/001  
Baud: V21 V22 V22bis B103 B212 HST  
Access: Reg LVA  
Computer: IBM 386 Clone  
DOS: MS DOS  
BBSSoftware: GTPower

## Koala Country

Sysop: Warren Leadbeatter  
Phone: (02) 671-5538  
GTnet: 302/016  
Baud: V21 V22 V22bis V23  
Access: Reg LVA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: GTPower

## LOCAL BBS

Sysop: Tony Dodds  
Phone: (049) 62-1768  
FIDOnet: 3:711/494  
Baud: V21 V22 V22bis V23  
Access: Public  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## Lodestone BBS

Sysop: Ian McWhirter  
Phone: (02) 456-3264  
FIDOnet: 3:711/407  
Baud: V22 V22bis B103 B212 PEP  
Access: Reg  
Computer: IBM XT Clone



# NATIONAL BBS LISTING

DOS: MS DOS  
BBSSoftware: Opus

## **M A X's BBS**

Sysop: Max  
Phone: (02) 412-3280  
Baud: V22 V22bis B103 B212  
Access: Reg  
Computer: Amiga 500  
DOS: AmigaDOS  
BBSSoftware: BBS-PC!

## **Macarthur BBS**

Sysop: Peter Degotardi  
Phone: (046) 28-1499  
Baud: V21 V22 V22bis V23  
Access: Public  
Computer: Osborne XT  
DOS: MS DOS  
BBSSoftware: Opus

## **Mail Dispatch**

Sysop: Matthew Wood & Andrew Avery  
Phone: (02) 969-5861  
FIDOnet: 3:711/905  
Baud: V21 V22 V22bis V23  
Access: Mem Reg  
Hours: Daily: 1600 - 0700  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## **Manly BBS**

Sysop: Chris Patten  
Phone: (02) 977-6820  
Baud: V21 V22 V23  
Access: Reg VA  
Note: Requires Ultraterm or Palette on C-64

## **MDL Citadel**

Sysop: Lindsay & Karen Gorrie  
Phone: (02) 796-7145  
Baud: V21  
Access: Public  
Computer: IBM Clone  
DOS: MS DOS  
BBSSoftware: Citadel

## **MEGA Technology TBBS**

Sysop: Stan White  
Phone: (049) 66-4213  
FIDOnet: 3:711/490  
Baud: V21 V22 V22bis V23  
Access: Mem VA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: TBBS

## **Milliway's**

Sysop: David Coucke  
Phone: (02) 357-7027  
FIDOnet: 3:712/306  
Baud: V21 V22 V22bis V23 B103 B212  
Access: Mem Reg VA  
Computer: IBM AT Clone  
DOS: PC DOS  
BBSSoftware: QuickBBS

## **Moebius Trip**

Sysop: David Butler  
Phone: (02) 439-7072  
FIDOnet: 3:711/408  
Access: Mem VA  
BBSSoftware: Opus

## **Monitor World**

Sysop: Rick Jones  
Phone: (02) 675-3027  
FIDOnet: 3:713/616  
Baud: V21 V22 V22bis V23 V32  
Access: Reg LVA  
Computer: IBM 386 Clone  
DOS: MS DOS  
BBSSoftware: Opus

## **My Other Half**

Sysop: Phil Young  
Phone: (02) 740-6246  
FIDOnet: 3:712/517  
Baud: V21 V22 V22bis V23  
Access: Reg LVA  
Computer: IBM 386 Clone  
DOS: PC DOS  
BBSSoftware: Opus

## **Newcastle Micro Club BBS**

Sysop: Tony Nicholson  
Phone: (049) 68-5289  
Baud: V21 V22 V22bis V23  
Access: Mem VA  
Hours: Weekdays: 1700 - 0830-  
Weekends: 24 Hours  
Computer: ASI XT  
DOS: MS DOS  
BBSSoftware: QuickBBS

## **Omega Board BBS**

Sysop: Paul Speirs & Linda Piltz  
Phone: (02) 792-1526  
FIDOnet: 3:712/711  
Baud: V21 V22 V22bis B103 B212  
Access: Reg  
Computer: IBM AT  
DOS: PC DOS  
BBSSoftware: QuickBBS

## **Opus Info Under**

Sysop: Bill Bolton  
Phone: (02) 449-2618  
FIDOnet: 3:3/113  
Baud: V22 V22bis PEP  
Access: File Server  
Note: Software support system for FidoNetSysOps - File Request ONLY

## **Out of This World BBS**

Sysop: Adam Todd  
Phone: (02) 477-6502  
Baud: V21 V22 V22bis  
Access: Reg VA  
Computer: IBM 386 Clone  
DOS: MS DOS  
BBSSoftware: Searchlight

## **Outdoors Education**

Sysop: Mel Lee  
Phone: (046) 58-1881  
Baud: V21 V22 V22bis  
Access: Reg VA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: GTPower

## **Outwest BBS**

Sysop: Greg Smith  
Phone: (02) 628-5738  
Baud: V21 V22 V22bis V23  
Access: Public  
BBSSoftware: Opus

## **Palantir C-64 BBS**

Sysop: Steve Sharp

Phone: (060) 40-1284  
Baud: V21 V22 V22bis V23 B103 B212  
Access: Reg VA  
Computer: C-64  
BBSSoftware: Punter

## **Paragon Bulletin Board**

Sysop: Jennifer Allen  
Phone: (02) 597-7477  
FIDOnet: 3:712/502  
Baud: V21 V22 V22bis V23  
Access: Reg VA  
BBSSoftware: TBBS

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*Twists feel the proper way to leave a board is to drop the carrier.*

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## **PC Users Group - Compaq Board**

Sysop: Bruce Edney  
Phone: (02) 540-1842  
FIDOnet: 3:712/505  
Baud: V21 V22 V22bis V23  
Access: Mem Reg LVA  
Computer: Compaq  
DOS: PC DOS  
BBSSoftware: Opus

## **PC Users Group - IBM Board**

Sysop: John Clarke  
Phone: (02) 724-6813  
Baud: V21 V22 V22bis V23  
Access: Reg LVA  
Computer: IBM AT  
DOS: PC DOS  
BBSSoftware: Opus

## **PC Users Group - Microcomp Board**

Sysop: Chris Kelly  
Phone: (02) 698-8769  
Baud: V21 V22 V22bis V23  
Access: Mem Reg LVA  
Computer: IBM PC  
DOS: PC DOS  
BBSSoftware: Opus

## **Phantom Connection BBS**

Sysop: Bob James  
Phone: (02) 398-2413  
FIDOnet: 3:712/311  
Baud: V21 V22 V22bis B103 B212  
Access: Public  
Hours: Daily: 2200 - 0600  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## **Poet's Dilemma**

Sysop: John Della-Torre  
Phone: (02) 804-6412  
GTnet: 302/000  
Baud: V22 V22bis HST  
Access: Mem Reg LVA  
Computer: IBM 386 Clone  
DOS: PC DOS  
BBSSoftware: GTPower

## **Professor Fate's Laboratory**

Sysop: Professor Fate

Phone: (02) 682-5828  
Baud: V21 V22 V23  
Access: Public  
Hours: Fri - Sun: 2300 - 0700  
Computer: Ultra XT  
DOS: MS DOS  
BBSSoftware: Wildcat

## **Prophet TBBS**

Sysop: Larry Lewis  
Phone: (02) 628-5222  
FIDOnet: 3:713/500  
Baud: V21 V22 V22bis V23  
Access: Mem Reg VA

Computer: IBM AT Clone  
DOS: PC DOS  
BBSSoftware: TBBS

## **Random Access Bulletin Board**

Sysop: Savong Mauv  
Phone: (02) 524-5410  
Baud: V22 V22bis B212  
Access: Mem Reg VA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: RemoteAccess

## **RCOM C-64 BBS**

Sysop: Simon Finch  
Phone: (02) 667-1930  
Baud: V21 V22 V23 V23ORG B103 B212  
Access: Reg VA  
Computer: C-64  
BBSSoftware: RCOM  
Note: Requires UltraTerm or Palette on C-64

## **Realistic Computing BBS**

Sysop: Keir Wells  
Phone: (066) 55-2388  
Baud: V21 V22 V22bis B103 B212  
Access: Public  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: Opus

## **Riverina BBS**

Sysop: Craig Sinclair  
Phone: (069) 67-2277  
FIDOnet: 3:712/420  
Baud: V21 V22 V22bis V23  
Access: Reg LVA  
Hours: Daily: 2000 - 0800  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: Opus

## **rti's Pinkboard**

Sysop: Laurence Singer  
Phone: (02) 264-8313  
Baud: V21 V22 V22bis V23  
Access: Mem VA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: Opus



## **RUNX**

Sysop: Mark Webster  
Phone: (02) 487-2533  
Baud: V21 V22 V22bis V23  
Access: Mem LVA  
Computer: IBM 386 Clone  
DOS: Xenix

## **SBA BBS**

Sysop: Bob Wilson  
Phone: (02) 872-6697  
FIDOnet: 3:711/406  
Baud: V22bis PEP  
Access: Mem LVA  
Computer: IBM AT  
DOS: PC DOS  
BBSSoftware: Opus

## **Sci-Fi BBS**

Sysop: Greg Hope  
Phone: (02) 646-4865  
Baud: V21 V22 V23  
Access: Public  
Computer: TI 99/4A  
BBSSoftware: Ti-Net

## **Sentry**

Sysop: Trev Roydhouse  
Phone: (02) 428-4687  
FIDOnet: 3:711/401  
Baud: V21 V22 V22bis V23  
Access: Mem VA  
Computer: IBM AT Clone  
BBSSoftware: Opus

## **SENTURA**

Sysop: Sir Data Bit  
Phone: (02) 790-4096  
Baud: V22 V22bis  
Access: Public  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: Wildcat

## **Shortwave Possums**

Sysop: Patrick Mcdonald  
Phone: (02) 651-3055  
FIDOnet: 3:713/605  
Baud: V21 V22 V22bis V23  
Access: Public  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: Opus

## **Small Business**

Sysop: Geoff Bilborough  
Phone: (049) 50-4211  
FIDOnet: 3:711/491  
Baud: V21 V22 V22bis V23  
Access: Public  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## **SMUG Opus**

Sysop: Stephen Thompson  
Phone: (02) 476-6396  
FIDOnet: 3:711/417  
Baud: V21 V22 V22bis V23  
Access: Mem Reg VA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: Opus

## **Software Connection**

Sysop: Graeme Nichols  
Phone: (02) 975-1006  
FIDOnet: 3:714/404

Baud: V21 V22 V22bis V32 B103  
B212 HST  
Access: Mem Reg VA  
Computer: IBM XT Clone  
DOS: PC DOS  
BBSSoftware: Opus

## **Software Tools**

Sysop: Bill Bolton  
Phone: (02) 449-9477  
FIDOnet: 3:711/403  
Baud: V22bis PEP  
Access: Reg VA  
Computer: Sharp 7501 AT  
DOS: PC DOS  
BBSSoftware: Opus

## **Sorcerer Users Group**

Sysop: John Cepak  
Phone: (02) 626-8020  
FIDOnet: 3:713/607  
Baud: V22 V22bis B103  
Access: Mem VA  
BBSSoftware: Opus

## **Sorcim microS**

Sysop: John Caine  
Phone: (065) 59-4537  
FIDOnet: 3:711/405  
Baud: V21 V22 V22bis V23 PEP  
Access: Public  
Hours: Daily: 2100 - 0800  
BBSSoftware: Lynx

## **Stardust BBS**

Sysop: Orbit  
Phone: (02) 645-3361  
Baud: V21 V22 V23 B103 B212  
Access: Mem Reg LVA  
Computer: C-64  
BBSSoftware: KBBS

## **Sydney CAE BBS**

Sysop: Geoff Shearsby  
Phone: (02) 660-8272  
FIDOnet: 3:712/628  
Baud: V21 V22 V22bis  
Access: Reg LVA  
Computer: IBM XT  
DOS: PC DOS  
BBSSoftware: Opus

## **Sydney Data Exchange**

Sysop: Roger Stockburger  
Phone: (02) 428-4249  
FIDOnet: 3:711/418  
Baud: V21 V22 V22bis  
Access: Public  
Computer: Macpro AT  
DOS: PC DOS  
BBSSoftware: Opus

## **Sydney Information Xchange**

Sysop: Lawrence Gould  
Phone: (02) 519-6681  
GTnet: 302/008  
Baud: V21 V22 V22bis  
Access: Reg VA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: GTPower

## **Syncopation**

Sysop: John Morrison  
Phone: (02) 907-9603  
FIDOnet: 3:712/513.5  
Baud: V21 V22 V22bis V23 B212

Access: Public  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## **Tachyonics**

Sysop: Richard Lenz  
Phone: (02) 438-2682  
Baud: V21 V22  
Access: Reg VA  
BBSSoftware: Fido

## **Tall Tower BBS**

Sysop: Charles Yendle  
Phone: (02) 632-1128  
FIDOnet: 3:711/417.6  
Baud: V21 V22 V22bis V23 B103  
B212  
Access: Public  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## **Tech Exchange**

Sysop: Chris Moran  
Phone: (02) 712-2282  
FIDOnet: 3:712/708  
Baud: V21 V22 V22bis V23 B103  
B212 PEP  
Access: Reg LVA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: Opus

## **TeleInfo Australia**

Sysop: Ross Delaforce  
Phone: (02) 975-1099  
FIDOnet: 3:714/407  
Baud: V21 V22 V22bis V23 B103  
B212  
Access: Mem VA  
Computer: IBM 386 Clone  
DOS: MS DOS  
BBSSoftware: TBBS

Phone: (02) 819-6971  
GTnet: 302/003  
Baud: V21 V22 V22bis B103 B212  
HST  
Access: Mem Reg LVA  
Computer: IBM 386 Clone  
DOS: PC DOS  
BBSSoftware: GTPower

## **The Bush Telegraph**

Sysop: Mark Kofahl  
Phone: (02) 481-8410  
GTnet: 302/012  
Baud: V21 V22 V22bis  
Access: Mem Reg LVA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: GTPower

## **The Cabal Connection**

Sysop: Ian Hunter  
Phone: (02) 625-6055  
FIDOnet: 3:713/612  
Baud: V21 V22 V22bis V23 B212  
Access: Reg VA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## **The City BBS**

Sysop: John Dawson  
Phone: (02) 456-4505  
FIDOnet: 3:711/410  
Baud: V21 V22 V22bis PEP  
Access: Public  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSSoftware: Opus

## **The Dead Zone**

Sysop: Mark Kelly  
Phone: (02) 805-5517  
Baud: V21 V22  
Access: Public

---

*Twits never register their  
Shareware; cash is what they  
use to buy faster modems.*

---

## **Terminal Madness QuickBBS**

Sysop: Sean Rodden  
Phone: (02) 975-2049  
FIDOnet: 3:714/406  
Baud: V21 V22 V22bis V23 B103  
B212  
Access: Mem Reg LVA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## **Texpac Electronic Magazine**

Phone: (02) 319-1009  
Baud: V21 V22 V22bis V23 B103  
B212  
Access: Mem  
Computer: TI 99/4A  
**The Black Hole**  
Sysop: Ken Thompson

Hours: Weekdays: 1800 - 0600-  
Weekends: 24 Hours  
Computer: IBM AT Clone  
DOS: PC DOS  
BBSSoftware: GTPower

## **The Final Program**

Sysop: Reg Langford  
Phone: (02) 548-1340  
FIDOnet: 3:712/513.8  
Baud: V22 V22bis B103  
Access: Reg  
Computer: IBM 386 Clone  
DOS: MS DOS  
BBSSoftware: QuickBBS

## **The Lost Tavern**

Sysop: Sean Murphy  
Phone: (02) 938-6836  
FIDOnet: 3:714/902





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## NATIONAL BBS LISTING

Baud: V21 V22 V22bis V23  
Computer: Blue Chip PC/XT  
DOS: PC DOS  
BBSoftware: Opus

### The Network Connection BBS

Sysop: Tony Johnson  
Phone: (02) 416-1078  
FIDOnet: 3:711/504  
Baud: V21 V22 V22bis  
Access: Public  
Computer: IBM PS/2  
DOS: MS DOS  
BBSoftware: OPUS

### The Oops BBS

Sysop: Ian Object  
Phone: (02) 626-5403  
FIDOnet: 3:713/614  
Baud: V21 V22 V22bis V23  
Access: Mem VA  
BBSoftware: Opus

### The WEB

Sysop: Dave Chapman  
Phone: (02) 570-9056  
Baud: V21 V22 V22bis  
BBSoftware: Quic<BBS

### Trantor

Sysop: Matthew Geier  
Phone: (02) 545-1995  
Baud: V21 V22 V22bis B103 B212  
Access: Reg VA  
Computer: MicroEee  
DOS: CP/M  
BBSoftware: ROS  
Note: RINGBACK

### Triops BBS

Sysop: Pdisk  
Phone: (063) 62-9715  
Baud: V21 V22 V23  
Access: Public  
Hours: Daily: 2100 - 1800

*Twits adore Sprint, MCI, and  
other long-distance credit card  
numbers, if they belong to  
someone else.*

### The Red Dragon Inn

Sysop: Zorro & The Draftsman  
Phone: (02) 708-6024  
Baud: V21 V22  
Access: Public  
Computer: C-64  
BBSoftware: KBBS

### The Runway

Sysop: Colin Lean  
Phone: (02) 569-5130  
FIDOnet: 3:712/506  
Baud: V22bis B103 B212 PEP  
Access: Reg LVA  
Computer: DeltaCom AT  
DOS: MS DOS  
BBSoftware: Opus

### The Skyline

Sysop: Phil Mackay  
Phone: (02) 872-6159  
FIDOnet: 3:711/801  
Baud: V21 V22 V22bis V23 B103  
B212  
Access: Reg  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSoftware: RemoteAccess

### The Twilight Zone

Sysop: The Mystic Machine  
Phone: (065) 72-3970  
Baud: V21 V22 V23  
Access: Reg LVA  
Hours: Weekdays: 2100 - 0600-  
Weekends: 24 Hours  
Computer: Apple //e  
DOS: ProDOS  
BBSoftware: GBBS Pro

Computer: C-128

BBSoftware: KBBS

### Ultimate-10 : The Ultimate BBS

Sysop: Ben Woo  
Phone: (02) 484-4004  
FIDOnet: 3:711/802  
Baud: V21 V22 V22bis B103 B212  
Access: Reg LVA  
Computer: IBM AT Clone  
DOS: MS DOS  
BBSoftware: Opus

### Wollongong Amiga BBS

Sysop: Peter Nicholson  
Phone: (042) 27-3927  
Baud: V21 V22 V22bis  
Access: Reg VA  
Hours: Weekdays: 1730 - 0800-  
Weekends: 24 Hcurs  
Computer: Amiga 2000  
DOS: AmigaDOS  
BBSoftware: Atredes BBS

### YABB

Sysop: Jonathan Chin  
Phone: (02) 804-6837  
FIDOnet: 3:711/833  
Baud: V21 V22 V22bis V23 B103  
B212  
Access: Reg VA  
Computer: IBM XT Clone  
DOS: MS DOS  
BBSoftware: TBBS  
**Zeta MINIX users**  
Sysop: Nick Andrew  
Phone: (02) 627-4177  
FIDOnet: 3:713/602  
Baud: V22 V22bis B103 B212  
Access: Reg VA  
Computer: TRS-8C



# NEW PRODUCTS



## New products?

WE ARE ALWAYS seeking new and interesting products to tell our readers about – we are particularly interested in products that would be useful to small businesses, professional offices and 'standalone' users. Please address release information to: **New Products, Your Computer, PO Box 227, Waterloo 2017 NSW**. Preference will be given to those accompanied by suitable illustrations. For inclusion in a specific month, material must be submitted 6 weeks prior to the cover date. We are also interested in the stories behind new Australian product development – if there is a tale to your product that you would like to tell our readers, please contact Mark Cheeseman, Features Editor, on (02) 693 4143.

### MIDI products

JL Cooper Electronics  
Phone: (03) 560 9111  
Fax: (03) 561 2614  
Price: Not supplied

JL Cooper Electronics have released a new range of MIDI patch bays, controllers and Macintosh MIDI interfaces: Fadermaster is a MIDI command controller featuring eight programmable MIDI faders; scan speed, range, grouping and MIDI channels are all selectable; the unit is supplied with ten user programs and 30 factory pre-sets and includes battery-backed RAM. Nexus is a 3-input by

8-output patch bay with toggle switches for each output port to select MIDI input A, B or C. Nexus Plus is a 2-input by 8-output patch bay featuring selectable merging, transposition, four overlapping programmable zones, plus channel filtering and auto thinning of controller data and toggle switches to select input. MacNexus is a MIDI serial interface for Macintoshes with one MIDI input and three outputs. SyncMaster is a dual-port Macintosh interface and SMPTE synchroniser; it features two MIDI inputs and six outputs, a free run mode and direct time lock. Synapse is a fully program-



## NEW PRODUCTS

mable 16 input by 20 output MIDI switcher and processor. Each of the three independently programmable processors has, amongst other features, channel filtering and bumping, data filtering and pitch bend. Multiple Synapse units can be interfaced through the digital expansion

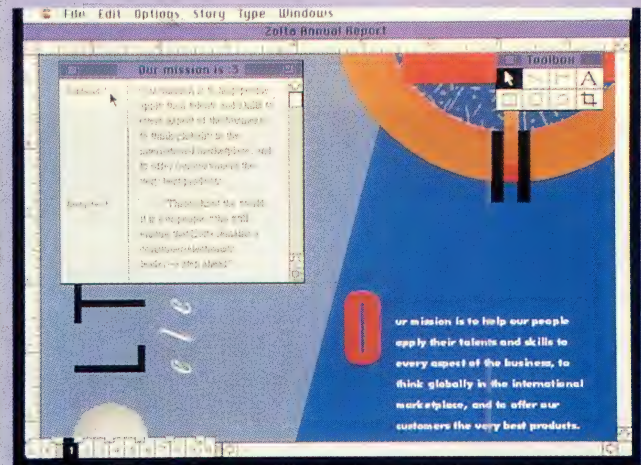
bus to form a large MIDI matrixing network.

### Star printers

Star Micronics  
Phone: (02) 748 4300  
Fax: (02) 748 3527  
Price: \$525 LC-10II  
\$849 LC24-10



## PageMaker 4.0 for the Mac



### InfoMagic Australia

Ph: (02) 975 1044

Due to be released in July

Aldus PageMaker 4.0 for the Macintosh range gives users more control of writing and editing functions through a new Story Editor, an alternative text-only window for faster wordprocessing. This new version also has an expanded type specification dialog box, as well as 'inline' graphics, a feature that automatically links graphics to their corresponding text as editing and layout changes occur – these two features are designed to simplify the production of long documents. Version 4.0 also includes a new links management feature for DTP workgroups – this facility allows users to keep track of changes made to text or graphics files that have been placed in the layout; it offers the user the option of updating the layout with the most recent version of the file.

New typographic controls allow text spacing to be adjusted from very loose to very tight and pairs of characters can be kerned either independently or within a range of text, to within 0.01 of an em. Special effects allow type to be condensed or expanded from 5 to 250 per cent of the original, to be rotated in 90-degree steps, and to set point size and leading in increments of 0.1 point, from 4 to 650 point. PageMaker for the Mac now includes all of the color features of PageMaker Color Extension, such as support for Pantone colors, the ability to import, display and print color illustrations, and 24-bit color images and a facility for preparing PageMaker files for color separations. The minimum system configuration is a Macintosh Plus or SE with 1Mb of RAM and a 20Mb hard disk.

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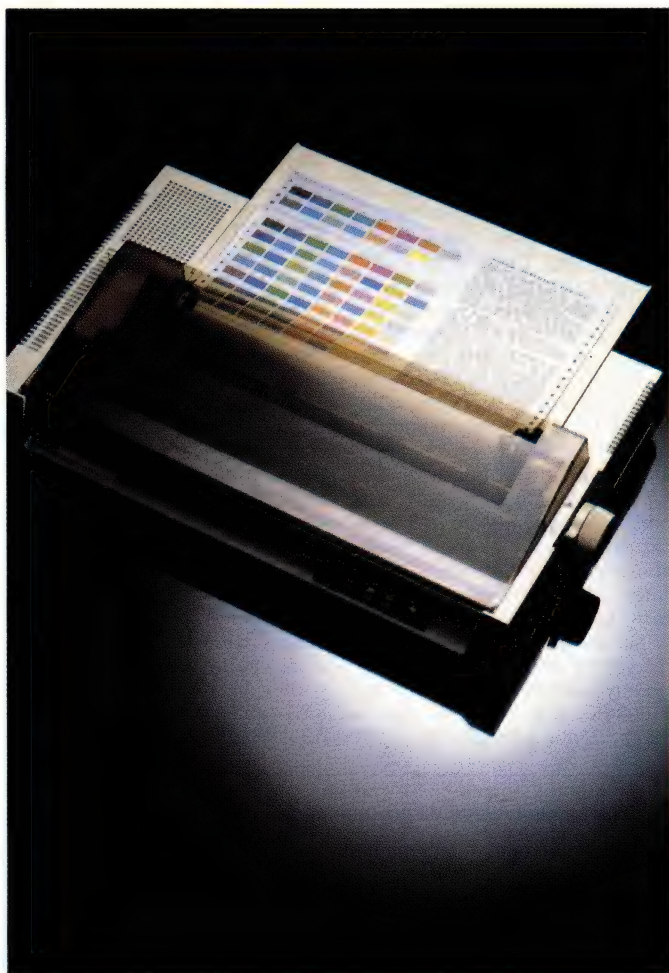
Only one offer with each purchase. Voucher worth \$20 at any Pizza Hut.

FOX & FOX VC.b.90

Superseding the popular Star NX-1000 and NX24-10, these two new printers are faster and carry European designations – the release is intended to stymie grey market importers who were offering 220V models to local users (both models are 240V). The 9-pin LC-10II features four NLQ fonts and has a range of print speeds from 30 characters per

second (cps) in NLQ mode to 180 cps in draft mode. The printer has a 4K buffer, friction and push tractor feed and paper parking; an automatic sheet feeder is optional. The 24-pin LC24-10 is similarly featured, with speeds ranging from 50 cps (draft) to 180 cps (NLQ) and a 7K buffer. Options include font cards, an automatic sheet feeder and a battery-backed RAM card.





### Seikosha printers

Mitsui Computers  
Ph: (02) 452 0452  
Fax: (02) 452 0481  
Price: See below

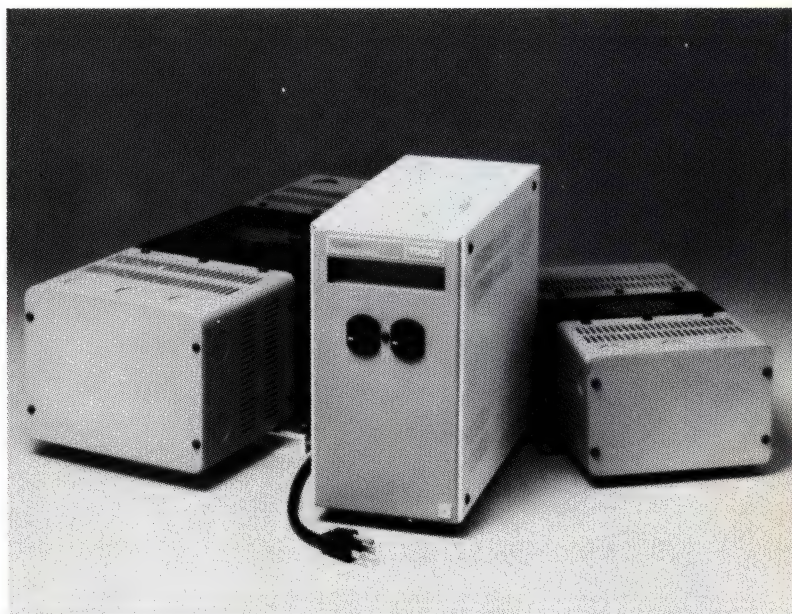
Mitsui are now distributing the Seikosha range of dot matrix printers and have announced the release of the new range. The flagship SBP-10 (\$6535) is an 18-pin dot matrix with a rated draft speed of 800cps (200 for NLO); that translates to 250 132-character lines per minute. The printhead is rated for 300 million characters and ribbon for 20 million. Standard configuration is a 64K buffer and two resident fonts. There is also a new series of 24-pin dot matrix machines, the SL series – the narrow carriage SL-90 is rated at 240cps in draft mode (80 in LQ), with a graphics resolution of 360 x 360, and has a 12K buffer, 1 standard and 8 optional fonts and two-way

paper loading; the wide carriage SL-200 and -230 are similarly featured. The MP series – pictured – of 9-pin printers (from \$1338) has a rated speed of 300cps for draft (50 in NLO), 5 selectable pitches, two-way paper feed and an optional color kit.

### Escort Power Conditioners

Online Control  
Phone: (02) 436 1313  
Fax: (02) 438 1480  
Price: from \$654

Designed for standalone PCs or small networks, the latest releases in the Topaz Escort range of power conditioners use ferroresonant technology to deliver high peak currents with minimal sine wave 'flat-topping', which has been a problem with similar units in the past. Providing common mode noise suppression of 126dB, normal mode suppression of 60dB, the conditioners



are suitable for use in industrial as well as office environments. There are three models to the range: Standard Office (70 to 1000VA), Wall-Mount Industrial (140 to 2000VA) and Freestanding 50Hz models (140 to 2000VA).

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Pavarotti comes courtesy his album; Tuto.

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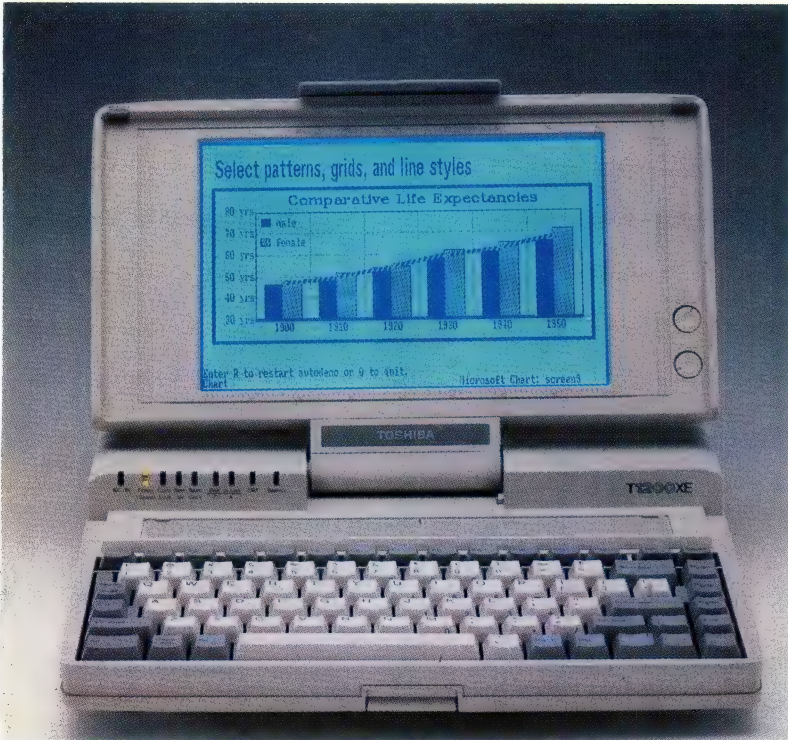
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FOX & FOX YC.c.90



## NEW PRODUCTS



### **Toshiba portables**

Toshiba Australia  
Ph: (02) 887 3322  
Price: \$4299 T1000XE  
\$5999 T1200XE

Toshiba have rounded out their laptop range with two new releases. The T1000XE notebook has a 20Mb, 25ms hard disk and weighs 2.8kg. The standard 1Mb of RAM can be expanded to 3. Intended as a second computer, the machine has no floppy drive and is supplied with the well-known LapLink package for transferring files between computers (it does have a port for connection to an external 3.5-inch floppy drive, however). The 4.77/9.54 80C86 processor supports LIM/EMS 3.2; Dos 3.3 is included. Options currently available include memory expansion cards, an external floppy drive, carry bags, a car adapter, additional battery packs and a quick recharging unit.

Only slightly larger than the T1000XE, the T1200XE has a 20Mb, 25ms 2.5-inch hard disk

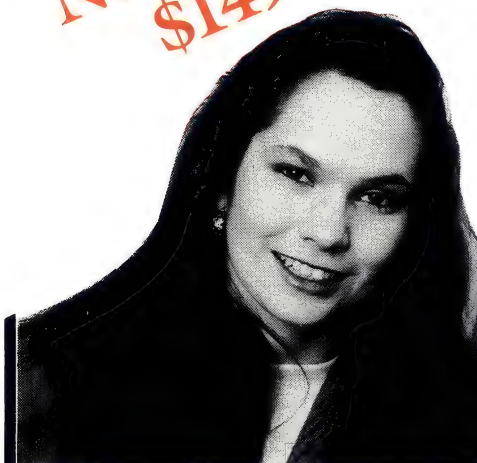
and a low-profile 3.5-inch floppy drive. Standard RAM is 1Mb (expandable to 5). LIM/EMS 4.0 and Dos 4.01 are included. The 80C286 processor runs at 6 and 12MHz. Available options are as for the T1000XE.

### **Dual Processor i486/i860**

Western Computer  
Ph: (07) 262 3122  
Fax: (07) 262 4957  
Price: from \$10,500

Queensland company Western Computer is now shipping a 33MHz symmetrical i486/i860 EISA-based dual processor computer system. Based on Hauppauge's 4860 motherboard, the architecture allows both processors to access main memory and the I/O system — memory arbitration between the two processors is configurable. Sockets are provided for a Weitek 4167 numeric co-processor and a 128K static RAM module for the i486. The system has 8 AT-compatible I/O slots: six 16-bit, one 8-bit and one 8/64-bit and an 8.33MHz I/O expansion bus. The

**New Price  
\$149**



**Your Computer — July 1989**

"For ease of use, cost and efficiency, it can't be beaten."

**PC Week**

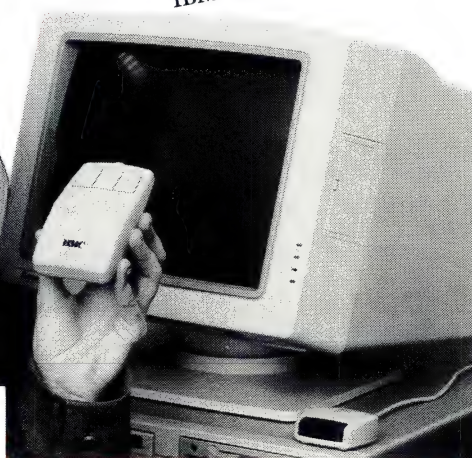
"The BMC Cordless Mouse emulates both the Mouse Systems Mouse and the Microsoft Mouse, and also boasts a fourth button which aids as a fine-tuning device for extremely sensitive cursor control."

**PC Magazine — English Edition**

"Main point is freedom of movement. Action is smooth and the accelerator button is useful . . ."

## BMC Cordless Mouse

**Paint Package  
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IBM Version Only



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### **Distributors:**

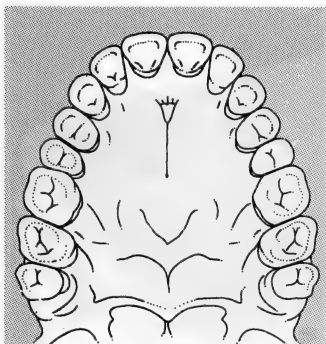
**Qld:** Computer Magic  
(07) 812 1611  
**NSW:** Matrix Computer Products  
(02) 418 6766  
Teco Australia Pty. Ltd.  
(02) 725 1233  
**Vic:** Teco Australia Pty. Ltd.  
(03) 762 9097  
**S.A.:** HPD Pty. Ltd.  
(08) 252 3300  
**W.A.:** Pro-Line Computer Systems  
(09) 430 5431  
**N.Z.:** Teco (New Zealand) Pty. Ltd.  
(09) 525 3640



base configuration has 2 serial ports and 1 parallel, 4Mb DRAM and no i860. The Hauppauge 4860 motherboard is available as a separate item.

## Medical Electronic Desktop

JAM Software  
Ph: (02) 799 1888  
Fax: (02) 799 4042  
Price: See below



JAM Software have released a range of medical software for the Macintosh. The M.E.D (Medical Electronic Desktop) Dictionary v1.0 (\$40) has both text and Word formats on the same disk and includes American, British and Australian spellings of medical terminology; the dictionary can be edited and expanded. The M.E.D. Graphics Disk (\$40) has a vast range of anatomical graphics in Encapsulated PostScript format. M.E.D Patient v1.2 (price not supplied), formerly sold as Mac M.E.D., provides a wide range of formats for medical record keeping and gives danger

alerts regarding contraindications, allergies and interactions. The program gives access to a knowledgebase for querying diagnosis, symptoms and signs, treatments and investigations. M.E.D. Maker is included with Patient as a tool for customisation of medical record format and the knowledgebase. A new feature of the software is the option to protect against modification of past records for medicolegal security.

M.E.D. Xtract (\$1000) is a data collection and collation utility for Patient. It provides powerful and flexible criteria for auditing and statistical analysis and other file, data extraction and manipulation functions. M.E.D Billing (price not supplied) features private and insurance billing, flexible multiple procedure and diagnostic codes, automatic preparation of bank deposits, over 64 different report and graph facilities, mail merging, as well as 'intelligent' receipting and a full audit trail of transactions.

## Acer 1200-486

Datamatic  
Ph: (02) 449 8133  
Price: Not supplied

Datamatic had been appointed Australian and New Zealand distributor for Acer Computers and announced their first release: the 25MHz Acer 1200-486 with an EISA bus. Based on Intel's i486, the machine has a standard configuration of 4Mb RAM (expandable to 64 on the system board). System memory uses a 128K



## Okilaser 400



## IPL-Datron

Ph: (02) 698 8211  
Fax: (02) 698 4043  
Price: \$2799

Using LEDs (Light Emitting Diodes) instead of the standard laser imaging system, the Okilaser 400 is claimed to give increased reliability and better quality. The four page per minute printer has a footprint of only 450 x 450mm and a height of 133mm. Offering standard HP Laserjet Series II emulations, there are 17 builtin fonts; resolution is 300 x 300 dots per inch. The standard 512K RAM is expandable to 2.5Mb. Manual feed is built in and paper trays are available for A5, A6, B5, Letter, Legal and 'executive' size paper and envelopes.

cache with paged interleave to perform at zero wait states. The full-sized unit can accept five half-height drives and up to 2 gigabytes of hard disk; six expansion slots are provided.

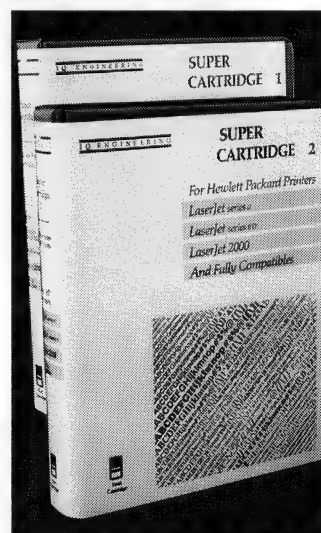
## Super Cartridges for LaserJet

### Logo Distribution

Phone: (02) 819 6811  
Fax: (02) 819 6930  
Price: \$799 Super Cartridge 1  
\$1299 Super Cartridge 2

IQ Engineering's Super Cartridge 1 works in all HP Laserjet and compatible printers with an appropriate cartridge slot and provides fonts from all 26 standard HP font cartridges from 4 to 16 points and multiple symbol sets in several fonts. There are ten typefaces, including two sets of proportional fonts, special computer typefaces and a range of fixed pitch 'typewriter' fonts. Both cartridges supply the fonts in hardware, which frees the printer's memory for graphics or special purpose fonts. The Super

Cartridge 2 (for the Laserjet II and Model 2000 printers) offers five proportional typefaces from 4 to 30 points, including a set of portrait orientation fonts. Drivers are included for WordPerfect, MS Word, WordStar, Lotus 1-2-3, PageMaker, Samna Ami and Ventura, amongst others.





## NEW PRODUCTS

### Printrix 3.0

The Computer Factory

Ph: (02) 938 2522

Fax: (02) 938 4287

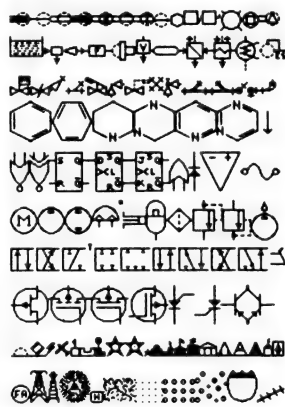
Price: \$395

\$70 Laser font pack

\$40 Standard fonts

Printrix is a page formatting program that enables users to easily include mathematical equations and expressions in a wordprocessing document created with MS Word, WordPerfect, WordStar and pfs:Write and text files from dBase, R:Base, Reflex and other data management packages. Expressions are described in the document using simple English - 'ABC over Z', for example. The package includes such text formatting features as proportional spacing, microjustification, margins, tabs, footers, page numbering and automatic flow-around for graphics in the document; automatic mail merge is supported for form letters and labels. Twenty-five fonts are included and more than 200 others are available. Printrix 3.0 now includes a page-preview facility and is VGA compatible.

#### FONTPAK 7



mats have a grey matt finish and chemical additives to combat static build up. A ground/earth lead is available to drain static charges in extreme environments. Company logos can be optionally incorporated into the mats.

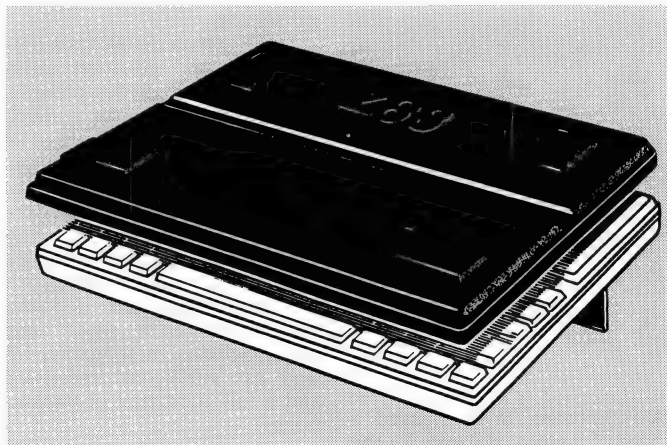
### Z88 Users Magazine

ZComp

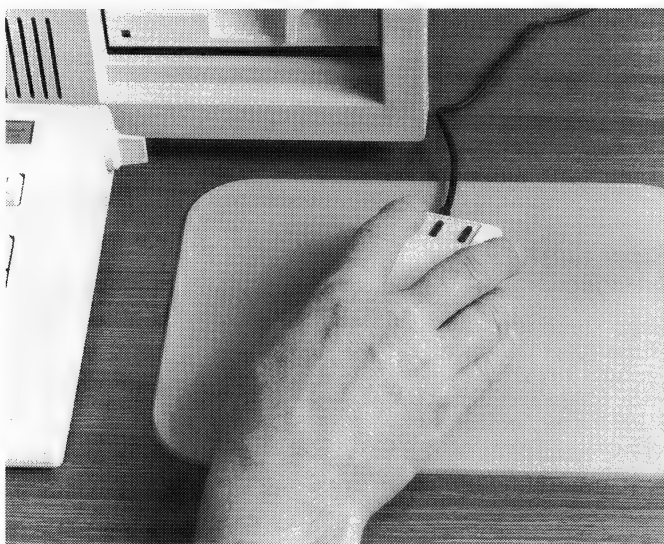
Ph: (02) 958 2797

Fax: (02) 958 2105

Price: \$25 per year



The Australian distributor of the Z88 is now publishing a bi-monthly newsletter for users. The first issue included a number of special offers for Z88 users, a tour of the inside, a selection of useful utilities (one of which gives the ability to print multiple files without having to load them individually, and another allows mail merging with Pipedream). It also described three undocumented features of the machine, and a wide selection of public domain and third-party software. If you would like to subscribe or contribute, the address is PO Box 106, Neutral Bay 2089 NSW.



### DSC Mouse Mat

DSC Management

Ph: (03) 560 6176

Price: \$29.50

\$12 ground/earth plug

Office safety product developer, DSC, has released a new mouse mat formulated from the same polymeric materials used in its static dissipative mats for desks and floors. The mats were designed to overcome three problems associated with most other mats: slipperiness, high profile and the generation of fluff. The washable

### IIT Co-processors

CAD Connection

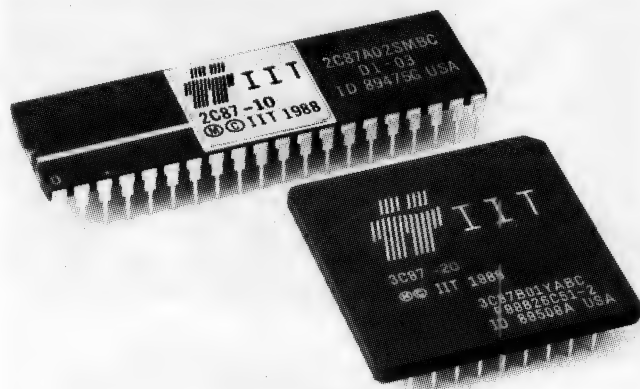
Ph: (02) 957 6719

Fax: (02) 957 4011

Price: from \$365 IIT-2C87

from \$680 IIT-3C87

Developed by two former Weitek executives, Integrated Information Technology's 2C87 and 3C87 numeric co-processors are plug and object code compatible with Intel's 80287 and 80387, respec-





## NEW PRODUCTS

tively. Operating at clock speeds up to 20MHz, the 2C87 requires fewer clock cycles than its Intel counterpart – for example, ADD typically takes 16 cycles with the 2C87 (85 with the 80287), DIV 48 (198) and SQRT 49 (183). The chip provides all 80387 instructions and enhancements, plus it expands 80286 data types to include 32-, 64- and 80-bit floating point and 32- and 64-bit integers and 18-digit BCD operands. The 3C87 is available in three clock speeds: 16, 20 and 25MHz. In the 25Mz version of the chip, ADD typically takes 11 clock cycles (compared to 31 with the 80387), DIV 44 (88) and SQRT 45 (125). The 3C87 has thirty-two 80-bit registers, 24 of which can be used as 3 stacks of 8 registers. Of interest to power laptop users is the fact that both IIT chips have a 'sleep-mode' as well as low power consumption when being accessed (150-500mW).

Fax: (02) 929 7198  
Price: \$259

Softcover's Alphaworks integrated package has over 50 new features including a relational database, file viewers, a search and index expression builder, maths co-processor support, user-definable pop-up menus and improved macro and mouse support. Alphaworks comprises six modules: a database, word-processor, spellchecker, thesaurus, spreadsheet, graphs and communications. It has the ability to create and read dBase III and Lotus v2 files and, with its support for extended memory, up to 29 files can be open at once. The package now includes a complete invoicing system, six different graph types and support for the YModem and Kermit communications protocols.

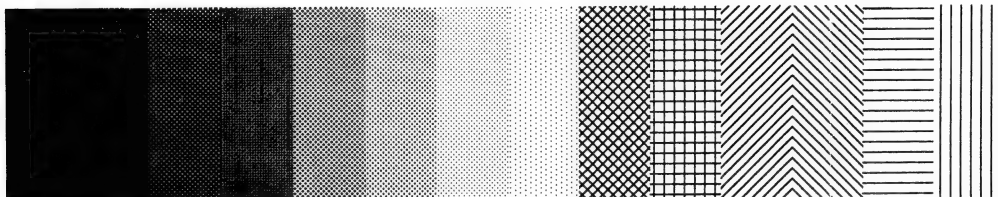
**AlphaWorks 2.0**  
Softcover Software  
Ph: (02) 957 4010

### Olivetti Printers

Olivetti Office  
Ph: (02) 748 2600  
Fax: (02) 748 2734  
Price: See below

Olivetti have expanded their already extensive range of printers with five new models. The 9-pin dot matrix DM309 \$895 and the

wide-carriage \$1095 DM309L have a high-speed draft mode (300cps), a normal 240cps for draft and 55cps for NLO; the print head is rated at 200 million characters. The PG306 \$2795 is a new 6 page per minute laser printer. The DM324 \$1145 and the wide-carriage DM324L \$1395 are 24-pin printers with a color option. Print speed for both printers is rated the same as the 9-pin models above. *All prices exclude tax.* □



## Communications for Mac Laptop

### NetComm

Ph: (02) 888 5533  
Fax: (02) 887 2839  
Price: \$649 Pocket Rocket  
\$299 Timbuktu/Remote v3.0  
\$895 Farallon Portable Pack

NetComm have released a range of communications products for the Macintosh Laptop. The Pocket Rocket 1234 Modem is an Australian designed and manufactured 2400bps unit that also supports Videotex 1200/75, 1200 and 300bps as well as Bell standards and the Hayes AT-command set. The modem includes a rechargeable NiCad battery (recharger and car adapter are supplied), the NetComm Program and a Macintosh modem cable. Timbuktu/Remote v3.0 is a screen sharing application that works as a desk accessory. It allows users to view or operate other Macintoshes over an AppleTalk network; this new version also allows file transfers. The Farallon Portable Pack allows Macintosh Portables equipped with modems to operate and exchange files via telephone or an AppleTalk network. The Pack includes two star phone connectors, a two-meter extension cable with RJ-11 plugs, a PhoneNet to LocalTalk adapter cable and two copies of Timbuktu/Remote.

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# IBM UNDERGROUND



JOHN  
HEPWORTH

## QEdit

**Y**OU CAN DRIVE A nail with an axe, open a paint can with a chisel, ruin your best screwdriver by using it as a scraper. But every tool has a purpose, something for which it was designed. Programmers typically are trying to create the perfect tool, and at the same time are often hobbled with a text editor that is less than optimum. Usually they just use a handy wordprocessor, and while these are tools that are great for creating and editing documents, they are less than ideal for editing programs.

QEdit is a text editor as opposed to a wordprocessor. Its features are geared toward creating and maintaining program source code and other text files. However, QEdit can also be used like a wordprocessor to write documents or letters since it includes word-wrapping and paragraph reformatting capabilities.

QEdit's features start with its compact size, speedy operation and the ability to edit multiple files simultaneously. They continue with a powerful set of commands that can be activated from a convenient menu, or by WordStar compatible Control key combinations, or via speed key combinations using the Alt or Control keys.

Features vital to programmers start with the optional automatic indenting, where each line automatically starts under the first character on the preceding line. The C mode adds intelligent indenting when the curly brackets { or } are used. Yet another mode matches brackets and parentheses, so that when the user enters a [, ( or open double quote, QEdit adds ], ) or closing double quote directly after the cursor, making it much easier to ensure that brackets are matched. This makes programming in C, Pascal or Basic much easier.

Other features include up to 99 scratch buffers to store text cut or copied from the various files, ready to be pasted into a new location.

There are several ways to Undo changes that were not what the author wanted. These start with UndoCursorLine, invoked with Ctrl-QL. Provided that the cursor has not been moved from a line, it will reverse changes made since the cursor arrived at the line. The second, and more powerful

undo command is called UnKill. QEdit maintains temporary storage areas for deleted text called Kill Buffers, and the default is 30 Kill Buffers per file. When any one of the editing commands – DeleteBlock, DelLine, DelRtWord or DelToEol – are used, the text cut from the file is placed in one of several buffers and can be recalled.

QEdit is easily customised. The user can specify the actions of all special keys on the keyboard like Alt, Control, F1 to F12, Home, PgUp, and so on, alone or in combination with other keys. Colors, screen appearance, and many other options can also be customised by the user. QEdit has macros which will execute a series of commands and keystrokes by pressing a single key.

QEdit Help		Press (Esc) For the Menu	
<b>Block</b>		<b>Cursor</b>	
copy block	^c, ^k	goto block beg	^g
drop anchor	^d	goto line	^j
mark block begin	^f, ^b	page down	^c
mark block end	^f, ^k	prev position	^p
mark line	^l	screen right	^r
move block	^m, ^w	scroll up	^u
rest block	^e, ^r	shiftright	^f
unmark block	^e, ^b	word right	^w
writeln	^n, ^u		
<b>Edit</b>		<b>Files</b>	
add line	^f	change filename	^c, ^f
delete block	^d, ^k	edit file	^e, ^e
del line	^d, ^l	exit	^x
del rt word	^t	file	^f
del to eol	^f, ^y	global exit	^x
dup line	^f	next file	^n, ^n
insert line	^i	prev file	^p, ^p
join line	^j	quit	^q
literal	^l	prev file	^p, ^p
split line	^s, ^u	save file	^s
undo cursorline	^q	shell	^s
unkill	^u	macro	^m
		macro record	^r
		<b>Windows</b>	
		close window	^c
		grow window	^g
		split window	^s
		next window	^n
		one window	^o
		prev window	^p
		shrink window	^s
		zoom window	^z
		Search/Replace	^s
		find	^f
		find replace	^r
		match	^m
		repeat find	^r

*The QEdit help screen. While many of the default commands are similar to WordStar, they can all be customised.*

### Windows

QEDIT CAN HAVE up to eight windows, each with a different file and/or showing different parts of the same file. Each window can be stretched or shrunk, or zoomed to take over the full area of the screen. But, the maximum number of windows does not limit the number of files that can be loaded into memory at once. The number is unlimited, and the only restriction is that all of the files being edited must fit into memory at the same time. In a 640K machine, around 400K is available for files after QEdit is loaded, so this is not a limitation that will hurt.

QEdit provides an easy-to-use 'pop-

down' style menu system which is very helpful while learning to use the editor. It is also handy for executing commands that are used seldom. Pressing Escape displays a bar with the first level options. These are File, Window, Block, Search, Print, Macro, Editing, Other and Quit. Moving the cursor to the option and pressing Enter, or pressing the capitalised letter in the option name, pops down a second level menu with multiple options from which a selection can be made in the same way. For experienced users, QEdit uses the Control and Alt keys in combination with various other keys. It also recognises many of the Control key combinations familiar to users of WordStar, and while these are rather odd to the novice, they are fast and convenient for experienced users.

Search and replace is fast and powerful, and can be invoked from the menu, or by using Ctrl-QA or Ctrl-QF as in WordStar. The search can be forwards or backwards, case sensitive or insensitive, and can globally make changes without user intervention or prompt for user confirmation before making each change. Yet another search option is whole word, which will ignore strings matching the search string if they are embedded in another word.

There is a fantastic search-and-replace mode is called Match. This acts only on the characters (, {, and [. With the cursor placed on one of these characters, enter the Match command. QEdit will then locate the logical matching ), } or ] character of the pair. Indispensable when programming in Pascal or C!

All editors mark blocks which are then cut, copied, moved and otherwise manipulated. QEdit marks blocks in various ways, including MarkLine which is fast. Put the cursor anywhere on the line at the start or finish of the block and press Alt-L. Now move the cursor to the line at the other end of the block and press Alt-L again. Both lines will now be shown in reverse video as will all the lines between them. DropAnchor allows you to mark a block one character at a time, and all you have to do is put the cursor on the first character to be marked and press Alt-A, and then move the cursor to the other end



```

L1 C1 IA 496k c:\pro\show.bas
***** DemoView.Bas - demonstrates ViewFile
'Copyright (c) 1988 Don Malin & Crescent Software

DEFINT A-Z

DECLARE FUNCTION Exist% (FileName$)
DECLARE FUNCTION DOSError% ()
DECLARE FUNCTION Null% (Work$)
DECLARE FUNCTION WhichError% ()
DECLARE FUNCTION ErrorMessage$ (ErrNum)
DECLARE SUB ViewFile (FileName$, NumChars, Rows, Colr, HiBit, Action)
DECLARE SUB WindowMgr (WindowNumber%, Action%, ULRow%, UICol%, LRow%, LRCol%,
CursorPos = CSRLIN
DIM ScrnBuff%(0 TO 4000)
CALL ScrnSave(1, 1, 25, 80, SEG ScrnBuff%(1), -1)

LOCATE 9, 9
CALL ScrnRest(1, 1, 25, 80, SEG ScrnBuff%(1), -1)

FS = COMMAND$
FS = LTRIM$(FS)

```

The editing screen in QEdit – note the status line across the top.

of the block, press Alt-A again and the block is marked.

Once blocks have been marked, QEdit provides several ways to manipulate them, including copying them from one file to another. In addition to the Alt key combinations to move, copy and delete blocks, QEdit recognises the WordStar Ctrl-KV to move blocks, Ctrl-KC to copy blocks to the cursor location, and Ctrl-KY to delete blocks. It also can use the grey plus, minus and asterisk keys to quickly cut, copy or paste.

## Special actions

OFTEN, WHEN PROGRAMMING, it would be very useful to duplicate the previous line exactly, or to duplicate many characters at the start of the line while making additions or alterations at the end of the line. A command called GetPrev copies characters one by one from the line above the cursor, while another called DupLine makes a copy of the current cursor line, inserts the new line below the current cursor line, and moves the cursor to the new line. The Align command lines up the left-most character of the cursor line with the left-most character of the line above it, making it easy to align portions of text which require a common left margin.

Other special functions include Shift-Left (Shift-F7) and ShiftRight (Shift-F8)

which shift text in a marked block to the left or right. To use these commands, first mark a block, then enter ShiftLeft or ShiftRight. The entire marked block of text will be shifted one column to the left or right respectively. If there is no marked block of text, or the cursor is outside of the marked block, the current cursor line is shifted.

QEdit will run on virtually any computer compatible with the IBM PC, AT or PS/2. It needs only 128K of memory, though it can utilise up to 640K if it's available, and of course, the more memory available, the bigger the file that can be edited. It needs Dos 2.0 or greater, one diskette drive, and virtually any standard combination of video board and monitor. QEdit supports enhanced (101 key) keyboards, and screens with up to 200 columns and 100 lines. With EGA, 43-line mode is supported, as is the VGA 50-line mode.

QEdit version 2.08 is a product of SemWare, 4343 Shallowford Rd, Suite C-3 Marietta, GA 30062-5003. It is available on your favorite bulletin board as QEDIT208, with the appropriate archive extension. Registration is \$US54.95 plus \$US13 for shipping to Australia. The price includes a disk with the latest version of the program plus a professionally printed and bound copy of the manual. A cheaper registration is also available if you print the manual yourself. □

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# Kult, Tintin and Teenage Queen

**T**INTIN ON THE moon, Kult, and Teenage Queen are three French games from Infogrames International, and are distributed in Australia by Atari Computers (Australia) Pty Ltd. System requirements for the games are an Atari 520ST or 1040ST, a single sided drive, and a color monitor. Each of the games come in standard cardboard box packaging with two single-sided disks and a manual. A minor irritant is that if you're lucky enough to have a second disk drive, it will lie idle during the game play, not one of the games recognises the second drive, but insists on swapping disks.

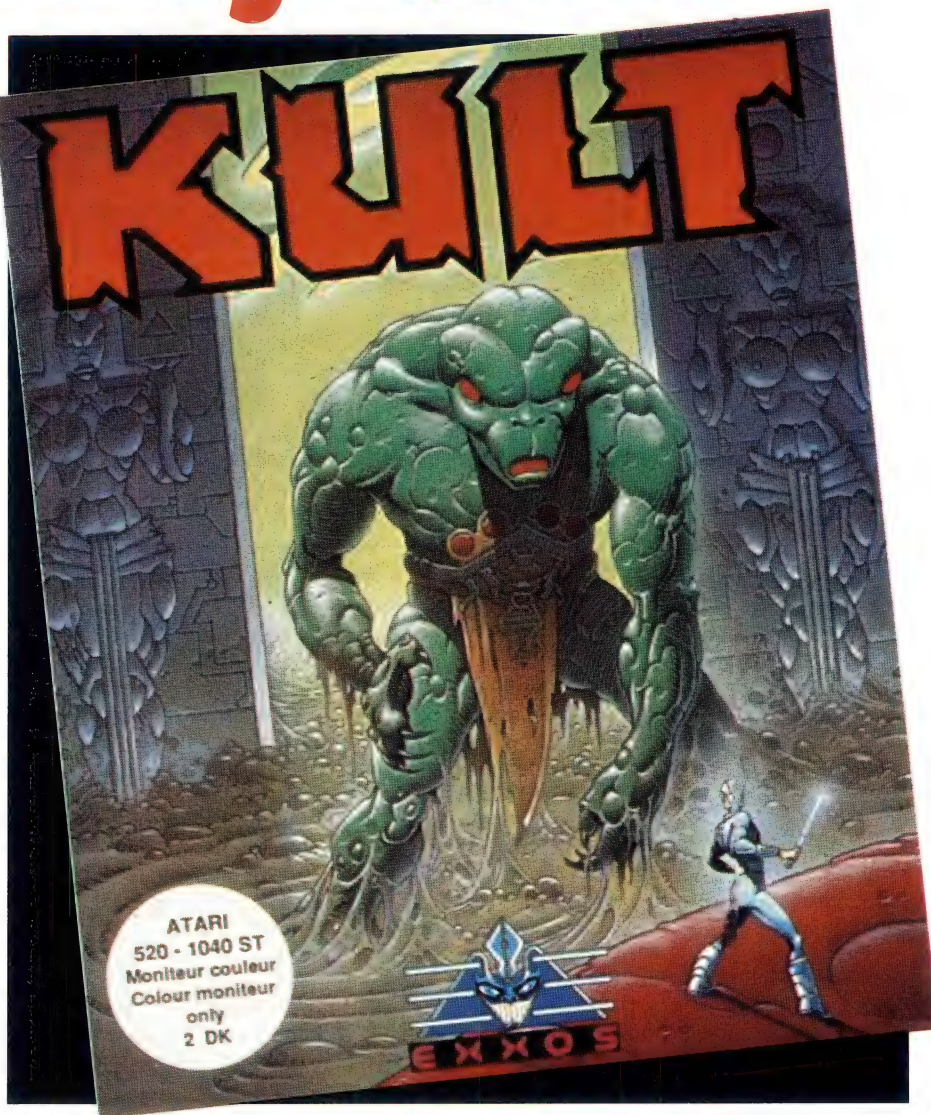
Kult (from Exxos Software, \$59 rrp) is a graphic adventure game set in some futuristic world over-run by a collection of odd creatures and mutants, but the central theme is quite simple – the exploration of a labyrinth of rooms and tunnels in order to rescue a maiden. The game is controlled with the mouse by highlighting an object or icon and choosing the required actions from a number of options.

---

*From time to time, there have been complaints about gratuitous violence in computer games.*

---

There are essentially two sections to be played in Kult. The first stage involves finding and collecting skulls hidden in four of the rooms and taking them back to a central location. But there's a catch. To find a skull you first have to solve a puzzle, and in each case you will need a prop such as a dagger or rope to help get the skull. At the beginning of the game you're given one of the props, which prop you're given is determined by the computer on a random basis. The type of prop you start with also determines at which of three possible locations the adventure starts. The order in which these three rooms (or a fourth room which does not need a prop) are



tackled has no bearing on the final game.

After a skull has been found, taken and deposited at the central location (the 'Master's Orbit'), the current prop can be traded for another one. The new prop will allow you to visit another room to solve another puzzle and so on. Trading props can be very frustrating as the Trader character insists on first playing the old shell game (guessing under which one of three cups he has placed a skull). Saving the game at this stage is absolutely essen-

tial as a wrong guess ends the game. I really wish programmers would not put this sort of randomness into adventure games as nothing is added to the play.

Having collected and deposited the four skulls at the Master's Orbit, you proceed to a fifth room ('In the scorpion's presence') which, in a sense, begins the second and last section of this adventure. If you've traded your props correctly (you should now have a rope and the stone fly) you will be able to complete the puzzle in



the fifth room successfully, obtaining another skull in the process. The remainder of the game proceeds in what is essentially a linear puzzle, that is, one room leads to another with alternative choices coming fairly quickly to dead ends.

In general, the puzzles are logical, well thought out, and could not be classed as being easy. Sometimes you may even have to resort to the time-proven method of trial and error to solve a particular puzzle. From time to time, there have been complaints about gratuitous violence in computer games, but the programmers of Kult have gone one step further and included one of the most tasteless pieces of programming I have yet encountered – to solve the puzzle in the Noose Room requires releasing the trap door on a set of gallows and hanging some poor individual. I say no more!

Overall, the graphics are very good with the exception that at times, some of the smaller objects which are important in solving the puzzles tend to blend in with the rest of the screen display. Whenever there's something important in a room, you will get prompts on the screen only if the cursor is placed on the object. This means that it's advisable to develop a strategy of moving the cursor over the

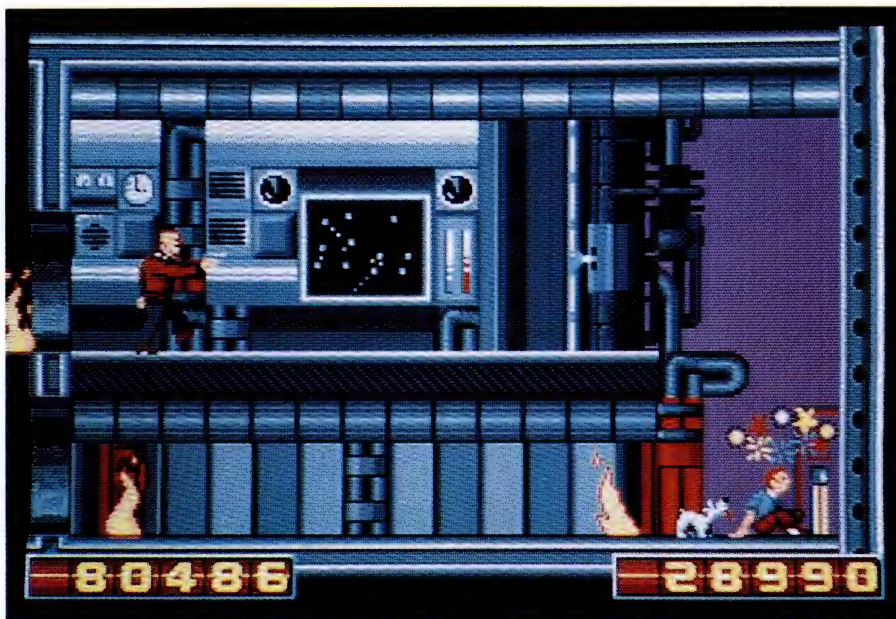
---

*Tintin on the moon is based on a comic strip character and I'm uncertain of whether or not being familiar with it helps in the enjoyment of the game.*

---

whole screen just to detect what your eyes cannot pick up. As a contrast to the graphics of the main game, there are two routines that are so poorly done that I cannot comprehend how they could have been included. The death of the adventurer (a somewhat frequent occurrence for me) and the final scene displaying a flying saucer taking off, may have been acceptable on a VIC-20 computer, but they certainly have no place on the screens of today's graphically sophisticated computers.

There's one final negative comment. In



*Tintin on the Moon involves surviving the various stages of the journey, trouble on board the spaceship itself, and finally, the actual moon landing.*

order to set a science fiction atmosphere and maintain it during the adventure game, the authors have included a booklet containing a lead-in science fiction story. I've been a great fan of science fiction writing for many years and have a library to attest to this, but the twaddle that accompanies Kult is the worst piece of writing I have ever read! I even feel sorry for the trees that had to be sacrificed into pulp to produce this trash.

### **Tintin on the Moon**

TINTIN ON THE MOON (by Herge, \$59 rrp) is based on a comic strip character and I'm uncertain of whether or not being familiar with it helps in the enjoyment of the game. In simple terms, the story line is that a rocket is to be launched from earth to go to the moon. The game play involves surviving the various stages of the journey, trouble on board the spaceship itself, and finally, the actual moon landing.

There's no user participation during the first stage of the game – you just watch as the rocket is prepared for the launch and the actual take off. The graphics here are fairly basic and similar actions have been performed better in other games.

Control of the game passes from the computer to you in the second stage where you fly the spaceship on its journey through space towards the moon. Apart from guiding the rocket, you also have to

pick up yellow and red spheres while avoiding meteorites. The yellow spheres increase the energy levels of the spacecraft. What the red spheres represent is still a mystery to me, although when you have collected eight of them, you automatically proceed to the next stage.

The spaceship may be controlled using a joystick, keyboard, or mouse. The joystick controls were so sensitive that there seemed to be no effective control over the spaceship. To check whether this lack of effective control was caused by the degenerative effects of age and tired reflexes, I asked someone far younger and fitter to try this section, but they had the same result – we got nowhere. On the other hand, the mouse option gave far easier control and using the mouse allowed this section of the game to be completed rather easily. In fact, the mouse option made the game so easy that there was no challenge in it at all. (The keyboard option of playing was not tried.) The graphics in this second section also leave a lot to be desired as they lack any degree of sophistication.

The third section of the game is far more enjoyable, both in terms of playability and in graphical quality. A point to mention here is that the mouse cannot be used in this section, even though it's perfectly acceptable in other parts of the game.

Your job now is to guide Tintin through





*The final part of Tintin on the Moon involves a moon landing, something I failed to accomplish successfully as I never seemed to have enough energy.*

various rooms in the spaceship itself whilst disarming bombs, extinguishing fires and freeing captives. Putting out the fires requires pressing the joystick trigger while aiming at the fire with an extinguisher. The other two tasks are accomplished simply by touching the appropriate character. As you move up and down ladders or along passage ways, the screen scrolls smoothly, allowing a fairly good piece of game play. Once you have accomplished a sufficient number of these tasks and caught up with the dastardly Colonel Boris, the game conditions are fulfilled and you proceed to the penultimate section which is nothing more than a repeat of the earlier space flight. There also seems to be a bug in this third section. A couple of times after performing very few of the allotted tasks, I was rather unceremoniously transported to the next section. The final part of the game involves a moon landing, something I failed to accomplish successfully as I never seemed to have enough energy, so I cannot really comment on it.

Overall, Tintin on the moon is a pleasant game with some enjoyable features. However, there is nothing particularly new about any of the game play and most of its

features have been done somewhat better in other games.

### Teenage queen

TEENAGE QUEEN (by Ere Informatique, \$59 rrp) is a strip poker game. The first disk contains the program itself and the second disk contains the graphics in compressed Degas format. This, of course, means that if you want a preview of Jocelyn Valais' screen art work, simply run Tom Hudson's Degas picture show program. The best art work is probably in the first picture where our teenage queen is fully dressed and even wears a hat and trenchcoat.

As the game progresses and our young lady disrobes, we are shown a series of screens that are basically inartistic and crass. I didn't find them offensive as such, but would not be surprised if others did not share this opinion. To me, they were rather puerile and simply not good artwork, and certainly not in the 'truly volcanic' class as claimed on the packaging. There are art packages such as Spectrum512 which could have been used in conjunction with digitisers to produce quite stunning screen art that in turn could have been adapted for a game such

as this, but unfortunately, this was not the case here.

Essentially, strip poker games can be looked at from two viewpoints – the quality of the poker game and the appearance of the disrobing player. Teenage Queen fails badly in both aspects. The screen art has already been discussed, now for a brief look at the game itself.

Teenage Queen does not use the full pack of cards but discards all cards below a seven. This could be to ensure that the computer loses quickly, but if a programmer goes to the trouble of writing this type of game, why not make a proper game of it? It's really very easy to win, especially when you realise the very simple strategy used by the computer, plus the fact that your own stake can fall below zero.

---

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*The only comment that I can make about Teenage Queen is that not only is it a very poor game, but it also has very uninspiring graphics.*

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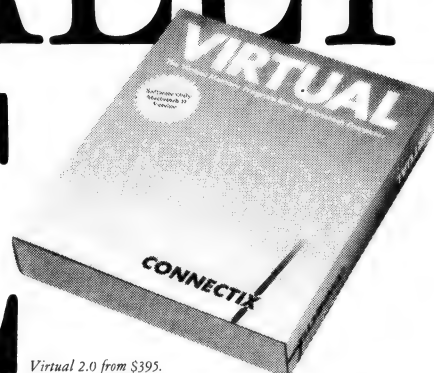
---

Another aspect of the game that was quite irritating was the silly little giggle from our computer maiden whenever she lost (very frequently). In fact, this giggle became so irritating that I turned the sound down to avoid it. The only comment that I can make about Teenage Queen is that not only is it a very poor game, but it also has very uninspiring graphics.

At this point I feel I need to reiterate that games have never been my forte, and knowing my biases even towards the best of games, I generally enlist the help of others, both relatives and friends, to provide me with comments, details about interest, playability and so on. All I then have to do is watch them play, have a go or two myself (when no-one is watching) and form an opinion or two to pass on to you. I try to be as fair as possible when reviewing this type of material while keeping in mind who the game is designed for. If you disagree with my opinions please write and tell me why. □



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ROY  
HILL

## For real beginners

**M**ANY THANKS TO all of you who wrote in supporting the concept of this section. I am surprised at the number of letters received. Here is the result of last month's homework. I hope some of you made mistakes and received some error messages. If you didn't, try leaving off the closing quotation marks and see what happens. That way, when you get a message you weren't expecting, you'll know the sort of thing to look for.

```
: GULLIBLE .' Roy Hill thinks that ALL software documentation is
EXCELLENT' ;
```

It's all very nice to print messages on the screen, but we would like to do something serious with our Forth compiler (or interpreter). How about a little maths?

The Forth system uses a mathematical notation known as RPN (Reverse Polish Notation), which is fundamental to Forth's use of 'stacks'. Forth systems normally have two stacks – the Data Stack and the Return Stack, although there's no reason why one can't have more than two. We will only consider the Data Stack for the time being, as that is where most of our mathematical operations will take place. The Forth stacks are exactly like the stack of trays in a cafeteria – the last one in is the first one out. This is known as a LIFO Stack (Last In First Out). A series of numbers can be placed on the stack and then we can perform operations on them. Forth has two words that can be used to display what is on the stack. The period '.' is used to display the number on the top of the stack *and then removes it*. This is called a destructive display, because it removes the value it displays. The other word, period-S 'S' is used to display the *total contents of the stack*. I have modified this word (the source code is shown below), so that it displays the *top* and *bottom* of the stack, as well as the number of items on the stack. Here is the new word, called S-period 'S.' –

```
VARIABLE MAX_S      \ a variable to keep track of the number of
\ items on the stack to be displayed by S. -
\ in this case it is set to 5 (see line 2
\ in the definition below)

: S.                ( -- )  DEPTH 0( ABORT" Stack UNDERFLOW !! "
                        DEPTH ?DUP MAX_S 0 1 ( IF 5 MAX_S ! THEN
                        IF CR DUP ." [ " 1 .R ." Items]" CR 0 SWAP ."
TOP"
                        CR MAX_S 0 MIN SWAP
                        DO 1 PICK 7 U.R CR LOOP ." BOTTOM"
                        CR ELSE ." Stack Empty." THEN ;
```

S-period is more useful than period-S for beginners, as it helps to remind the novice which is the top and which the bottom of the stack. 'S.' is designed to work with F-PC, but may be made almost universal by omitting DEPTH 0< ABORT" Stack UNDERFLOW !! '

from the first line. Incidentally, one very easy (but not very proper or elegant) way of clearing the stack is to type in a Forth word that is non-existent. This generates an appropriate error message and also clears the stack. Let us now see how the stack is used to perform some maths. Fire up your Forth system and type in –

```
2 3 4 5 6 (ENTER)
```

– remember to put spaces between each of the numerals so that Forth can tell the start and finish of each number. Now type in 'S.' and press Enter (or 'S' and press Enter if you didn't create the new word. This is what you should see –

```
S.
[5 Items]
TOP
6
5
4
3
2
BOTTOM
```

– now type \* + \* SWAP / and press Enter. Re-display the stack using S. and then experiment with other values for homework. We must use the SWAP command to get the last values in the correct order for division (incidentally, the only number left on the stack should be 51). The same applies for subtractions, but not for additions or multiplications (obviously). *It is absolutely vital that stack manipulation be mastered.* This forms the basis of *all* Forth operations.

```
COMMENT:
Mandelbrot Set Display - Contributed by Gary Luke
COMMENT:
anew mand \ for forgetting
fload sfloat \ need software floating point routines
floats
fload vga \ also need VGA routines
: pixel-on ( x y --- ) $07 dot ;
: pixel-off ( x y --- ) $00 dot ;
decimal
\ Region of the imaginary world to render,
\ defined by center co-ordinates and magnification.
-0.5000000000 fconstant Ccent
0.0000000000 fconstant Zcent
000000.5 fconstant magnification
variable iterations
```



```

\ Calculations of parameters to suit the region
\ Screen proportions are 1.0:1.5 for my monitor (as they are
for most)
1.0 magnification f/      fconstant Zside
Zside 1.5 f*              fconstant Cside

\ Boundaries of region = centres +/- half-sides
Ccent Cside 0.5 f* f-      fconstant Cmin
Ccent Cside 0.5 f* f+      fconstant Cmax
Zcent Zside 0.5 f* f-      fconstant Zmin
Zcent Zside 0.5 f* f+      fconstant Zmax

\ Step size per pixel for horizontal and vertical scans
\ For other modes of resolution, alter "640" and "200"
640 value Hor-res
200 value Ver-res
Cside Hor-res ifloat f/    fconstant Cstep
Zside Ver-res ifloat f/    fconstant Zstep

\ Co-ordinates of pixel being calculated.
fvariable Cee  Cmin Cee f!
fvariable Zed  Zmin Zed f!

\ Make a variable to hold the number of iterations during the
calculation
variable tally

\ Calculation for each pixel.
: mandelcalc ( --- n | c z --- )
  0 tally !          \ initialise tally to zero
  iterations @ 0 DO
    f2dup fdup f*      \ c * c
    fswap fdup f*      \ z * z
    f2dup f+           \ c*c + z*z
    4.0 f)            \ if c*c + z*z > 4
  IF
    f2drop leave      \ then exit with
  THEN
    fswap f-          \ c*c - z*z
    Cee f@ f+         \ C + (c*c -
    z*z) // next c
    frot frot 2.0 f* f* \ 2*c*z
    Zed f@ f+         \ Z + 2cz
  // next z
    1 tally +!        \ increment the
  tally
  LOOP
  f2drop ;

\ Main Calculation Loop
: mandelbrot ( number of iterations | --- )
  iterations !
  high                \ 640*200
  monochrome
  Hor-res 0 DO        \ Scan from left
  to right

```

```

0 Ver-res DO          \ Scan from
bottom to top
  j i pixel-on        \ turn pixel on
  0.00 0.00 mandelcalc \ c = 0.0, z =
  0.0
  tally @ iterations @ \ test tally
  IF
    j i pixel-off      \ set pixel
  THEN
    Zed f@ Zstep f+
    Zed f!            \ next vertical
  pixel
  -1
  +LOOP
  Cee f@ Cstep f+ Cee f! \ next
  horizontal pixel
  Zmin Zed f!          \ restart at
  bottom
  key? IF              \ so that we can
  leave anytime
  leave
  THEN
  LOOP
  7 emit quit 0 mode text ; \beep when
  completed

```

**Listing 1.** Gary Luke's Mandelbrot routine which runs under F-PC (F88). Note that even for 50 iterations this procedure will take some considerable time to execute (yes, even in Forth).

### Information required

I HAVE HAD a request from Mr Hess of Bulleen, Victoria, for any information regarding the availability of Forth for the 8048 – 8052 series of micros. If anyone knows of any versions (I certainly don't), could you please advise me through this column?

Gary Luke (of Feral Technology in Sydney), who also contributed some interesting items in February's column, has supplied a very neat Mandelbrot routine which runs under F-PC F88 (see Listing 1). I have taken the liberty of making several minor changes to the program to make it easier to read and use. Note that this procedure will take some considerable time to execute (yes, even in Forth). Execution is commenced by supplying a value for the number of iterations –

```

50 MANDELBROT
1500 MANDELBROT

```

– for the first value (50), go and make a cup of coffee. For the second, take the family to the beach (or the mountains) for a day or so.

Once again, this routine demonstrates the brilliance of the F-PC package. Many thanks to Gary for his continued support of this column. □





PETER  
PHILLIPS

## Is it perfect?

**W**ORDPROCESSORS ARE coming thick and fast at the moment. This month I'll look at WordPerfect GS, and next month, BeagleWrite GS (actually Multiscribe in new clothes). First, a look at Appleworks GS V1.1, a Timeout utility for Appleworks, and a few bits and pieces...

According to literature that landed on my desk recently, there is a bug in System 5.0.2 that occurs under certain circumstances when the 'Save As' option is used. Apparently, if you have previously used a ProDos 8 program (such as Appleworks), and you are now in a ProDos 16 application, then if the file exists in the target directory, the 'Save As' dialog box will blink, the computer will hang and the file won't be saved. Watch out for it!

Softswitch, an alternative to the graphics based IIGS finder/launcher, has now been updated to make it compatible with System 5.0.2. The new version also has some extra features, but the only contact number I have for this program is one in the US. No doubt it will filter through to Oz eventually.

On the subject of software updates, my favorite IIGS game, Tetris, from Spectrum Holobyte, now has competition posed by a similar game called Welltris. This new game, written by Alexey Pajitnov (who also wrote Tetris), has now been released for the IBM, and includes three dimensional perspectives and pieces that can be rotated around four walls. The news is that a IIGS version is on its way!

### Timeout Telecomm

ANYONE WHO USES Appleworks (classic) will either have, or be aware of, the range of Timeout applications produced by Beagle Bros. Normally, I would not be describing Timeout applications in these pages, as this is really material for the IIe and IIc computers. However, I have just received a Timeout application called Telecomm which is worthy of note for IIGS owners. This application allows the user to send Appleworks files via a modem, and the great news is that it supports the IIGS serial port.

I use communications software quite a bit, both to communicate between com-

puters (IIGS to IBM) and to send files to magazines. Timeout Telecomm has now filled a glaring gap in my available line-up of communications software, since I now can transfer files from within Appleworks without the need to exit, then wait while a communications program is loaded. But, perhaps you are wondering why I am discussing Appleworks rather than Appleworks GS, particularly when I have spent considerable time singing the praises of the latter?

Yes, Appleworks GS is great, but I have a penchant for text-based wordprocessors, and I love the Appleworks database. However, when I want to move files from one application to another, I usually get into Appleworks GS and manipulate my Appleworks files this way. In other words, I use them both, perhaps to an equal amount, getting the best of both worlds into the bargain.

---

*Appleworks GS is great,  
but I have a penchant for  
text-based  
wordprocessors.*

---

Timeout Telecomm is supplied on both a 5¼ inch and a 3½ inch disk, along with a well laid out manual which assumes very little knowledge of the Timeout series. Installation is very easy, and I had my IIGS and my IBM talking to each other after approximately 10 minutes. Not bad considering I have never used any Timeout applications before, as Appleworks GS has so far filled all the gaps offered by the Timeout series.

The Telecomm application is fully featured, and supports a range of modems, various terminal emulation modes, autodial, script files for logging on to a host, and various serial cards. It uses the well established Christensen protocol, generally known as XModem, along with the enhancements Apple users have grown to

expect. These include the ASCII Express mode and the Binary II modes, in which the file characteristics are sent along with the text.

The cost is \$99.95, and the program is distributed by Dataflow (134 Barcom Ave, Rushcutters Bay 2011 NSW). No doubt most Apple dealers will have this Timeout application, and I can assure you it works well with the IIGS.

### AppleWorks GS 1.1

LAST MONTH I promised more information about the latest revision of AppleWorks GS, now known as version 1.1. Unlike many revisions, this one is not free unless you purchased the program after 15th October 1989, although it is cheap enough at \$39.95. But is it worth even this small amount? Is it cold in Antarctica? In fact, AWGS users running system 5.0.2 don't really have much choice, unless you don't mind software that doesn't take advantage of the speed enhancements of the new system. The package containing the updates includes four disks, two containing System 5.0.2, the other two the revised program and utilities. As well, a small manual intended to supplement the original is supplied. If you are upgrading from System 4 or earlier, the speed improvements will be dramatic, but System 5 users who are upgrading from the previous revision (supplied free to all AWGS owners) may not notice a great difference.

There are, however quite a few good reasons that justify purchasing the new version. It has enhanced memory utilisation and compatibility with 1.125Mb IIGS computers (ROM 3) and allows accents and diacritical marks used in foreign languages as well as a variety of special characters to be created. As well, there are color palettes that support graphics from DeluxePaint II, Paintworks Plus, Paintworks Gold and TopDraw, allowing graphics to be imported into AWGS without a color change.

There are other additions, including 'contains', 'begins' and 'ends' functions for the database and spreadsheet. Also, a utility that converts previous AWGS database files for use with V1.1 is supplied. Like the previous revision, a memory test



routine is provided that checks out all RAM in the IIGS. So, all in all, Claris are right behind AWGS, and if you don't have a copy at all, now is the time. It has to be the best all round IIGS program going, and is good value at \$375.

The review copies were supplied by Dataflow (address above), the distributors of the program.

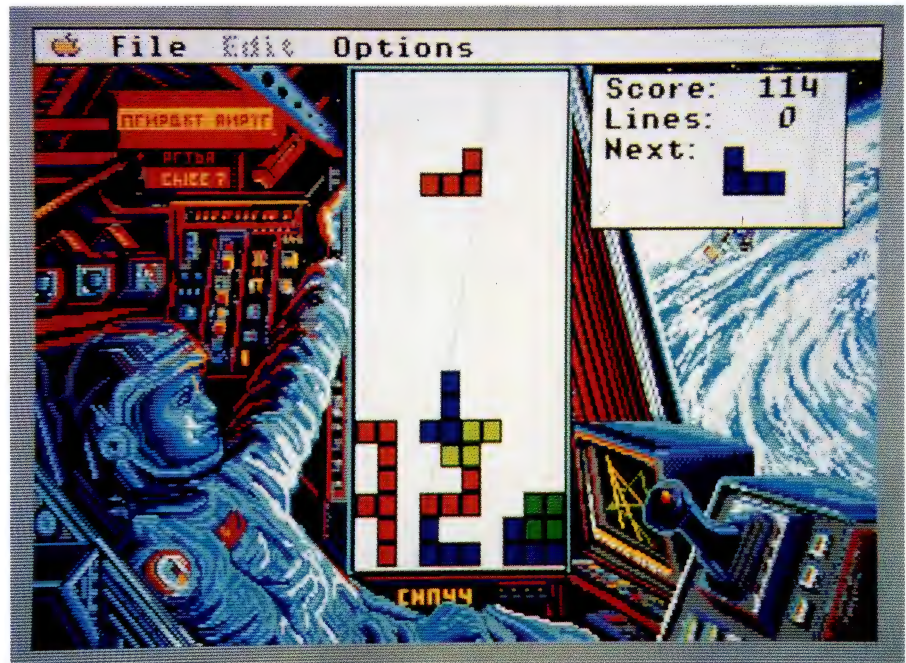
### WordPerfect V2.1

WORDPERFECT IS A program well known to IBM computer users, and it has become established as one of the industry standard wordprocessors. In the IBM world, WordPerfect is used by professionals more than home users, as its complexity is often overkill for someone wanting to write a few letters. The IIGS version of WordPerfect (WP) is a derivative of its IBM counterpart, and comes on three disks, supplied with a manual that looks (and is) most professional. I installed the program onto the hard disk using the install utility, but I recommend using the IIGS desktop, as the install routine is one of those ProDos 8 text types, with all its usual idiosyncrasies.

Once WP was installed, I buckled up my seat belt to start learning this very different and very sophisticated IIGS program. As I said previously, I don't really like graphics based wordprocessors, as they are too slow for my liking. But then, I earn my living using a wordprocessor, so I guess that puts me in the 'professional user' category. And, WordPerfect is perhaps more for professional users than casual users. For example, it's the only IIGS program I have ever seen that supports my HP Deskjet printer.

WordPerfect is a fully featured text-based wordprocessor that uses the Apple interface (mouse, pull-down menus). Being text-based, it is fast in response, but limited in its ability to show the effects of font changes, super and subscripts, and so on. Like the IBM version, it has a clean screen facility, in which all you see is your text, and one line of information giving the page number and cursor position. Printer codes are inserted either by pull-down menu, or with 'keyboard equivalents', such as Apple B for bold. Printer codes can be viewed by selecting Show Codes, in which the screen is divided to show a section of the text and the same text with embedded codes, now available for editing as though they are text characters.

Like most wordprocessors, it has a spelling checker facility with a dictionary



*My favorite IIGS game, Tetris, from Spectrum Holobyte, now has competition posed by a similar game called Welltris, also written by Alexey Pajitnov, the author of Tetris. Welltris has now been released for the IBM, and includes three dimensional perspectives and pieces that can be rotated around four walls. The news is that a IIGS version is on its way!*

of some 115,000 words, and a thesaurus with incredible cross referencing. In fact, it is the best thesaurus I have seen on a wordprocessor, as it operates quickly (either mouse or keyboard driven) and displays a large range of words grouped in up to three lists that include the verb, noun, adjective and antonym. Each list has a scroll bar, giving an almost infinite range of words. An excellent feature!

It also has the usual cut and paste features, used in the same way as most IIGS software, in which the selected block of text is highlighted by dragging the mouse across the block. However, the block can also be manipulated in a range of other ways. For example, you can select 'case convert', and change all the selected text to upper or lower case. Or, the selected block can be printed, saved to disk as a separate file, made bold or underlined.

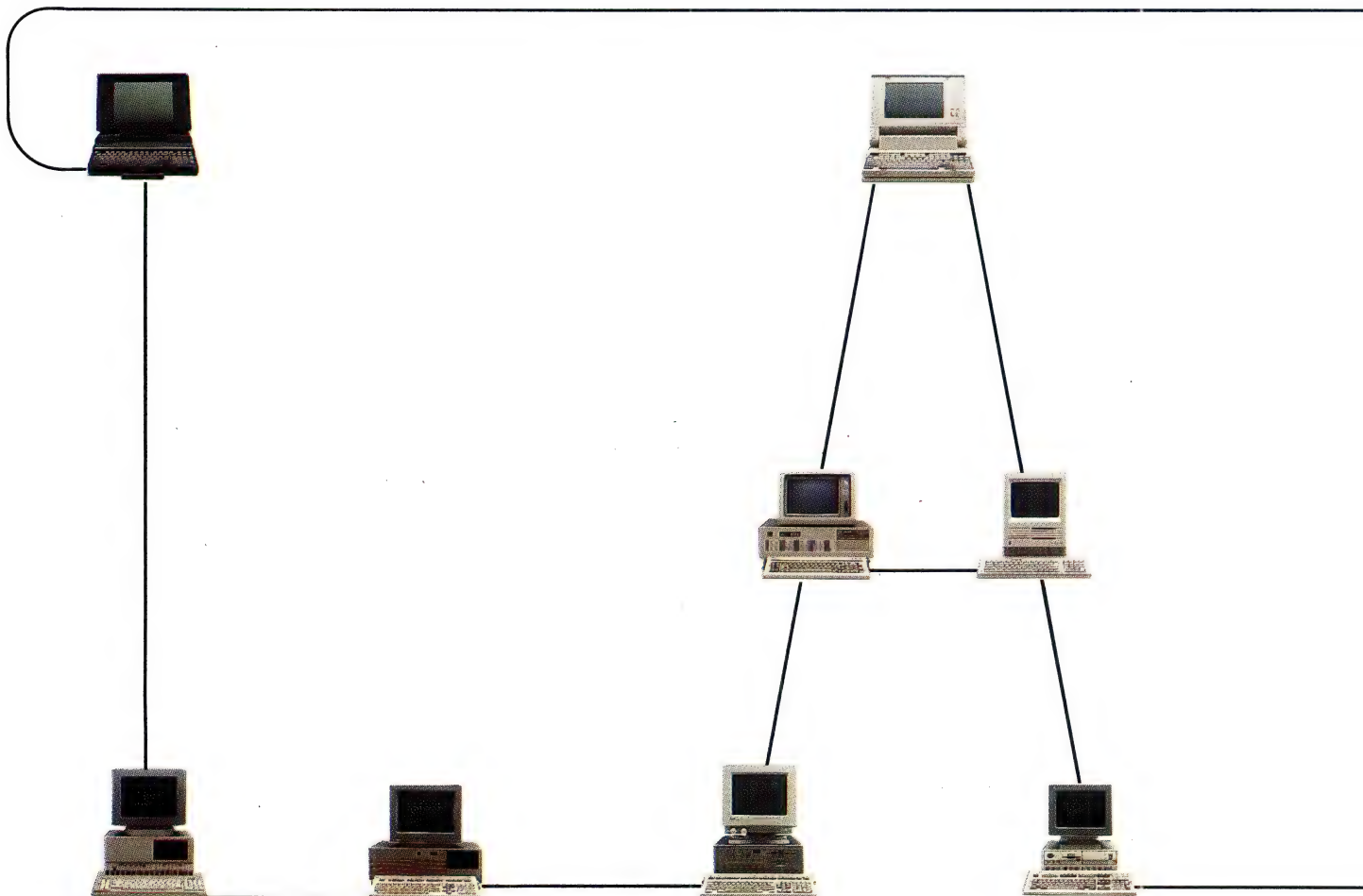
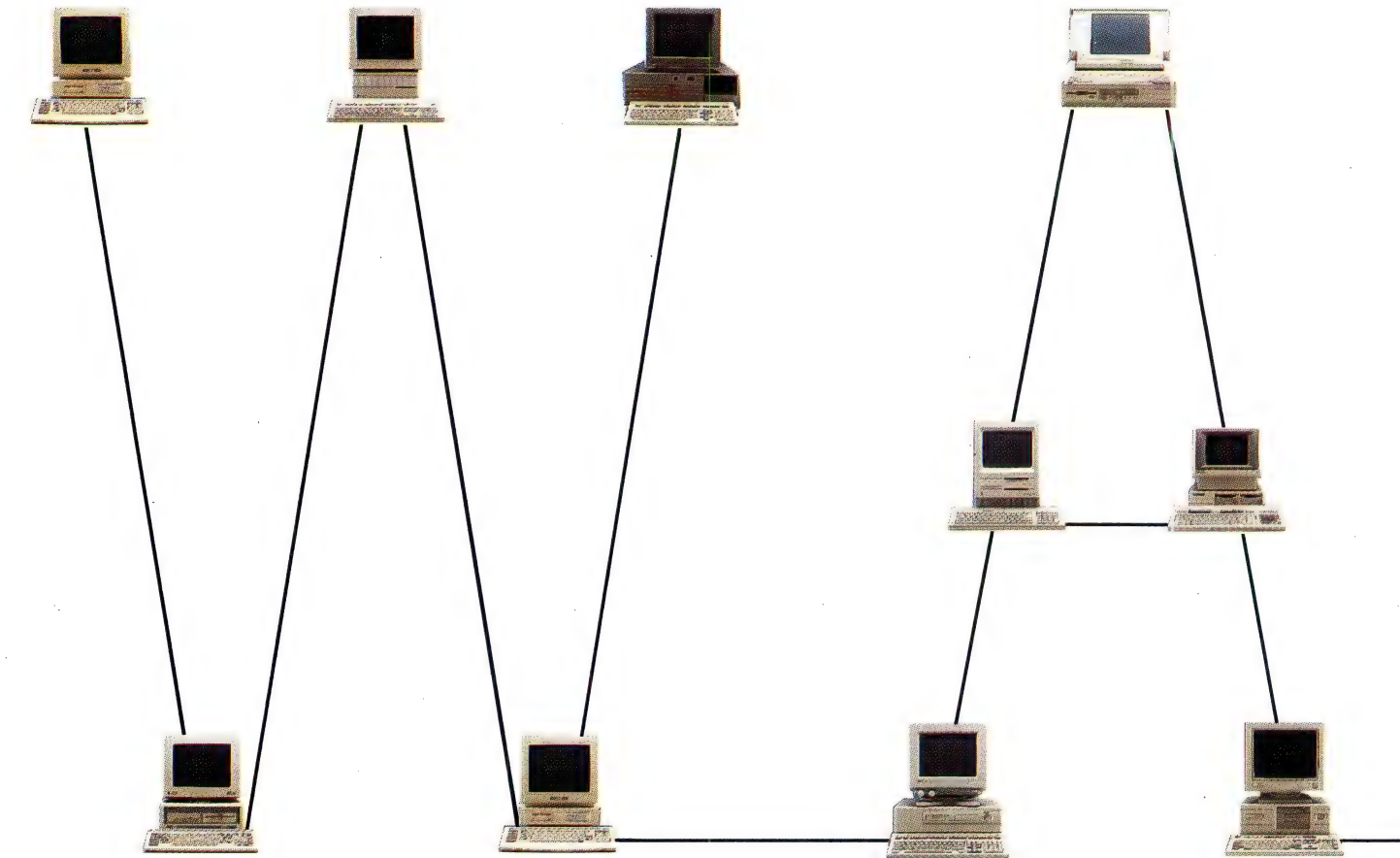
WordPerfect, like most IIGS applications, uses windows, which allows a number of files to be opened at once. This way, text is easily moved between documents using the clipboard rather than using disk based transfers like most IBM type wordprocessors. But the big question is will WordPerfect read an Appleworks file? Yes,

but not directly. To load a document from Appleworks requires the document to be converted using a utility program called Convert. Once converted, the file can be opened as a WP file, complete with all its formatting. The Convert utility can convert files from a range of Apple wordprocessors, such as PFS:Write, Bank St Writer, Applewriter II, and so on. The obvious omissions are all IIGS graphics based wordprocessors, such as Appleworks GS.

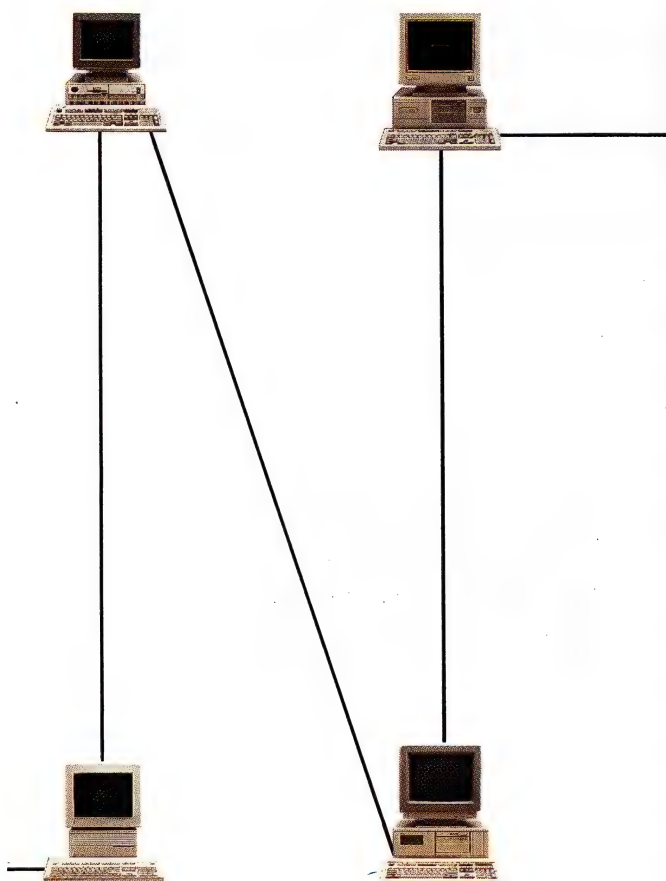
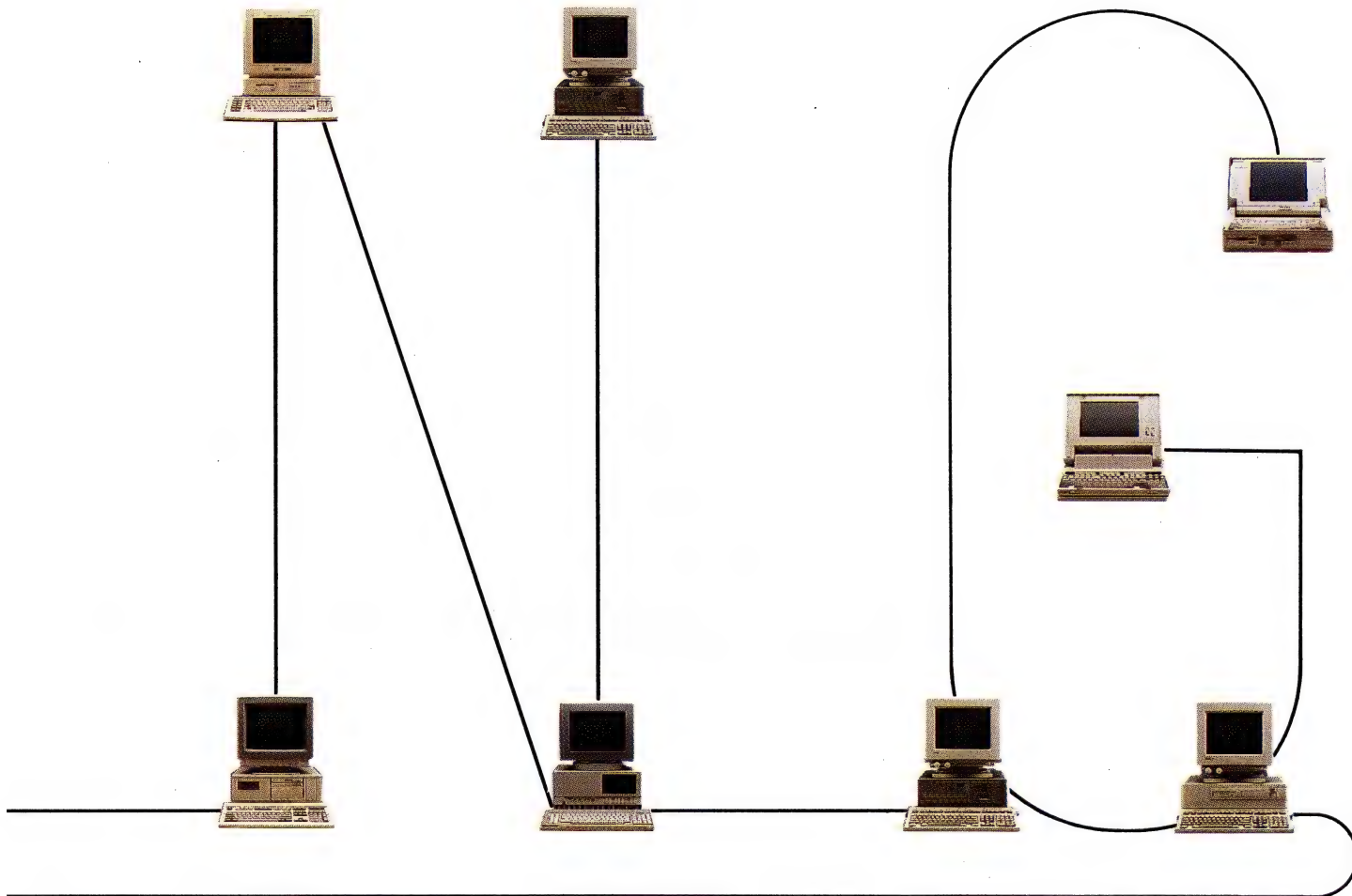
There's lots more to WordPerfect, such as the usual search and replace facilities, tab setting commands, font selection (including proportional spacing), macros, mail merge facility, footers, headers, date insertion and so on.

Has WordPerfect got it all? Well, yes ... but there are a few odd characteristics about it that I find rather strange. The most obvious is that it is not really WYSIWYG. All, but the most basic, wordprocessors at least show the effect of right margin justification, but not so with WordPerfect. Also, it does not support italics, which seems unusual, although it does allow the insertion of printer commands. The only print enhancements that are displayed on screen are bold and underlin-









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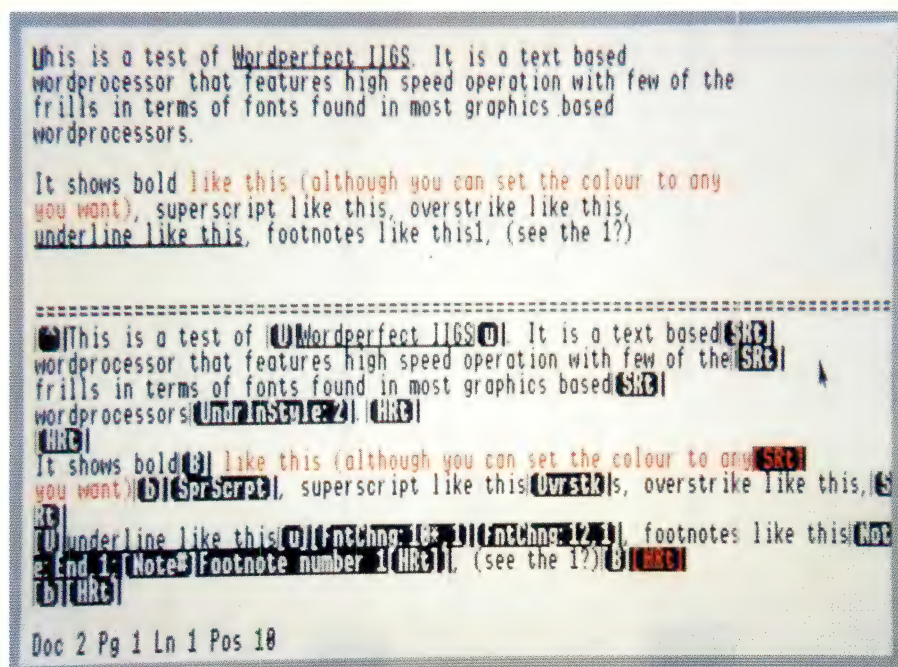


ing, and it is possible to loose text off the screen.

But make no mistake, this is one hell of a powerful program. It supports a huge range of printers (including various laser printers), as well as most of the printer cards manufactured for the Apple range of computers. Because of its complexity, you won't learn WordPerfect at one sitting, but that's the price you pay for sophisticated software.

### Summing up

I LIKE WORDPERFECT GS. According to my sources, previous versions of this program had a few bugs, but none were apparent in V2.1. The program offers virtually every possible wordprocessing feature, is very versatile and relatively easy to use thanks to pull-down menus. It's a program for all users, and would give an office manager a good excuse to install a IIGS, as the best of both worlds would be achieved. The Apple desktop allows computer 'housekeeping' tasks to be undertaken easily, and WordPerfect puts it into the professional use class. The review copy was also supplied by Dataflow and is available from dealers for \$265. □



WordPerfect is a text-based wordprocessor for professional users. Shown here is a clean screen (optional) with text as entered (top) and the same text with the embedded commands displayed (bottom).

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GREGG  
FAULKNER

# The good, the bad and the weird

**T**HIS MONTH'S COLUMN is very bitsy. It's been that sort of a month for me. Some good things have happened, a couple of not so good things, and a heap of really weird things.

First, the good things. I've upgraded my A2000 to 5Mb of RAM, achieved simply by purchasing 16 one megabit chips and plugging them into the sockets on my A2058 expansion card. The job was a lot easier than I had anticipated, and the only difficulty was self-imposed by the elaborate anti-static precautions I took.

I figured the most anti-static surface I could think of would be a stainless steel sink, so I performed the whole surgery on the sinktop with myself wired from both wrists by anti-static straps. Whether it was really all necessary I doubt, but it's nice to be successful even if the precautions are a bit over the top.

After inserting the 16 chips into the appropriate sockets, all that needed to be done to tell AmigaDos that I now have an extra 2Mb of RAM was to shift a small link clip on the board. The whole process took about half an hour and was basically boring, but then, excitement is the last thing I look for in such an exercise.

With the extra RAM, I can make good use of the bootable RAM disk feature of V1.3, carrying nearly 1Mb of boot material in the RAD: device. Warm boot from RAD: is lightning fast and avoids all the aggro normally caused by frequent fallovers while trying elaborate experiments with the system software.

My second hardware activity of the month was the addition of a GVP 80Mb hard-disk-card to the Amiga 2000. I settled on the GVP unit after scouring all the documentation I could lay my hands on, and talking to vast numbers of hard disk users. Now I'm very glad I chose GVP.

The unit arrives shrink-wrap sealed in a sizable carton. Inside, well cocooned in plastic foam and bubble-wrap. The 80Mb Quantum SCSI drive is already mounted on the board, along with the controller circuitry and Autoboot EPROMs. The new model GVP unit also has sockets for 2Mb of fast RAM to be plugged in on the board, using two 1Mb SIMMs.

My spell checker went berserk with the

last paragraph so I had better explain a few acronyms. SCSI, pronounced *skuzzy* despite someone's original wish for it to be pronounced *sexy*, stands for Small Computer Systems Interface. It looks like becoming the standard choice for hard disk connectivity. It's very easy to use and permits up to seven disks to be daisy-chained from a single controller.

## EPROM

EPROM STANDS FOR Erasable Programmable Read Only Memory. EPROM chips hold the microcode instructions to allow the hard disk controller to be 'seen' by Kickstart as a bootable device. This in turn allows the Amiga to boot up from the hard drive without having to use a Workbench floppy disk.

---

*Here in Australia, with  
the possible exception of  
people with a postcode in  
the Simpson Desert, we  
have never really picked  
up on mail order  
purchasing.*

---

Finally, for this paragraph anyway, SIMM stands for Single In-line Memory Module. A SIMM is a tiny printed circuit board which is populated with RAM chips to provide a quantity, usually 1Mb, of memory in one plug-inable unit. Phew, now back to our story.

Packed along with the hard-card was a well-produced manual and a disk of installation software. I decided to test GVP's installation software by following the instructions precisely, dotting the Is and crossing the Ts the way a raw beginner might do. Guess what? It worked perfectly. This would have to be the easiest installation procedure I have ever experienced.

All I had to do was click on a single icon

and the installation procedure took over and did all the work. I only had to specify the number of partitions (two) into which I wanted the drive formatted. Helpful screen messages appeared all the way through the initialising and formatting procedure, which is very reassuring for a first-time user. The procedure is lengthy, well, what do you expect for 80Mb? So reassurance along the way is very nice.

The installation procedure even copies the Workbench directories and files across from the Install floppy into the first partition of the hard drive. Once the install is finished, the hard drive is ready for auto-booting straight away. Magic!

Eighty megabytes is a lot of hard drive and even I haven't managed to fill it yet, despite loading several of each type of package known to mortal man. I learned an important lesson a while back with a 45Mb hard drive - keep the number of icons in any window to a minimum as this makes navigation through Workbench a much faster experience.

Speaking of speed. Oh, weren't we? The Quantum 80S hard drive supplied with this card is fast. *Very* fast! To be precise, it is rated at 11 milliseconds access time. Let me put it another way. Double-click on the Deluxe Paint III icon and in less than 1.5 seconds the specifications screen is up. That's fast! A complete cold boot with a complex V1.3 start-up sequence, including s/startupII and s/startupIII, with a lot of applications assigns is completed in less than 15 seconds.

To say that I'm enthusiastic about the GVP Hard-Disk-Card+2 would be a drastic understatement. I'm rapt. Incidentally, I bought the hard card by mail order from Power Peripherals, 68 Woods St, Laverton 3028 Vic, and their service was fast and efficient. They even called me about a week later to check that everything was OK, which is a nice, and sadly uncommon, touch. Prices start from \$1,338 for the 45Mb drive, up to \$2,232 for the 100Mb Quantum drive.

## Pike and degree of difficulty

NOW, COMPLETING A mental triple twist with pike and a degree of difficulty of about \$7.50, let me stick with the topic of



mail order. Buying by mail order has been an accepted way of doing business in the US for a long, long time. Here in Australia, with the possible exception of people with a postcode in the Simpson Desert, we have never really picked up on mail order purchasing. Perhaps we watch too much of the postie in *The Comedy Company*, or maybe we Aussies are untrusting.

For some time now, a couple of mail order companies have been operating out of Canberra, specialising in Amiga software. One of these, Interlink Software, has now opened a shopfront as well as continuing its mail order business. Kim Mars and Jeremy Wilson, the principals of Interlink, tell me they have over 1,200 Amiga titles in their catalog.

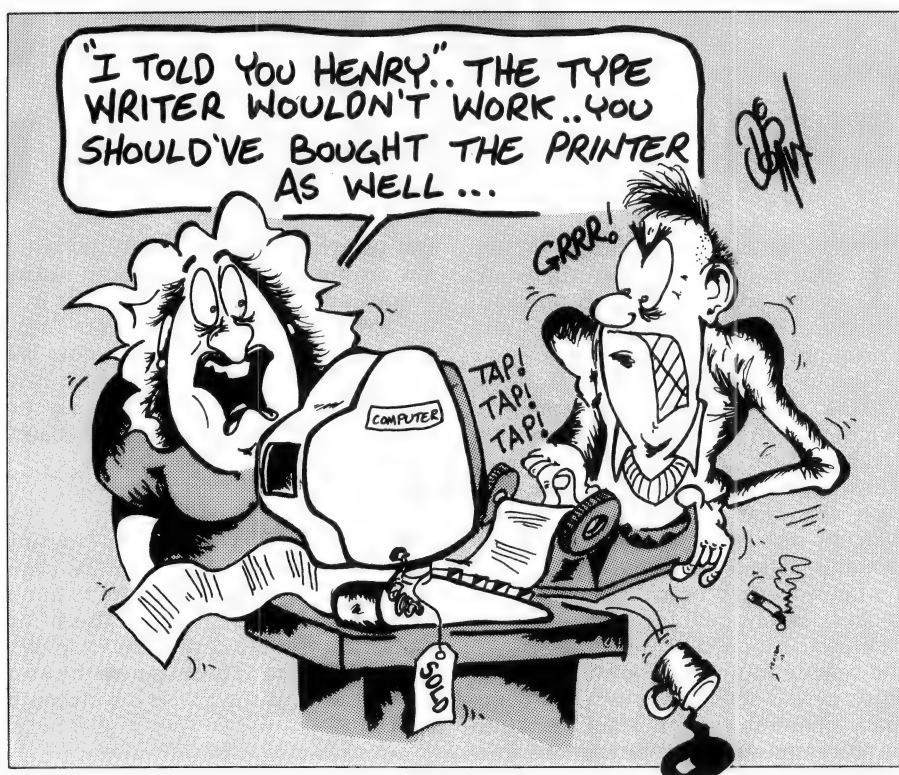
Interlink provide, as a matter of course with each purchase or on request, a monthly software price list for each machine they support. They carry a large range of entertainment and educational titles for MS-Dos machines, a range of primarily entertainment titles for the Commodore 64/128, and a huge range of all types of software for the Amiga.

Mars specialises in Amiga productivity software while Wilson takes more interest in the entertainment side. However they want to arrange it, they have the biggest display of Amiga software I've seen in one place, and my Bankcard is the worse for it.

*ECP like to collect 'pirate' copies of their own software, just to keep track of what is circulating out there in the software sewers.*

Interlink intend to fight the Australian resistance to mail order shopping. Their weapons are fast turn-around of orders and extensive stock-holding, combined with competitive pricing. The 12 page price list for Amiga software includes a number of helpful reviews and information items, and is yours free for the asking. Interlink can be contacted by phone on (062) 93 2233 or by fax on (062) 93 1438. Their mail order address is PO Box 1155, Tuggeranong 2900 ACT.

Now, under the heading of 'really weird', let me tell you about my purchase



of Populous. In a moment of weakness I decided to buy The Cook a copy of Populous (well, to tell the truth I was rather keen to have a go at it myself).

When I got home, I fired up the A2000 and booted up from the Populous disk. I decided to let the game run its demo mode, so I just sat back and watched. Imagine my surprise when the second line of the scrolling credits turned out to read 'Cracked by QUARTEX'.

Let me set the record straight by telling you that this is *not* the first time I have seen the name Quartex. I have some excellent sources from whom I receive the occasional scurrilous copy of something or other, and the name Quartex is well known among the low life. I do not, however, expect to see it appear on software I have paid genuine hard currency for.

It turns out that Populous is distributed in Australia by a Gold Coast company called Entertainment and Computer Products Pty Ltd, which is in turn owned by Electronic Arts, one of the major American software distributors and publishers. EA and ECP decided that the most efficient method of distributing popular titles in Australia was to duplicate the disks here, rather than ship disks around the world.

ECP like to collect 'pirate' copies of their own software, just to keep track of

what is circulating out there in the software sewers. It seems that in the rush before Christmas, one of ECP's temporary staff slipped the wrong master disk into the duplicating machine and, well, you know the rest. At least ECP had the decency to be embarrassed about the situation, even if they didn't immediately offer to replace my disk with a genuine article. In case anyone from ECP reads this, *yes* I *really* would like the disk replaced, please.

The user manual provided with Populous is less than adequate. In my case, it was simply a photocopied version with pages 8 and 9 repeated instead of pages 4 and 5. Apparently, photocopying manuals saves money too! After my long and loud whingeing about software prices, I should be the last to object to any cost-cutting measures, but missing pages make learning a new and complex game very difficult.

I don't want to hurl too much offensive matter in ECP's direction because they did offer to replace my manual, though I didn't hear the same offer regarding the disk. But it does point to a fairly cavalier attitude toward the software buying public by a company whose parent is well known for screaming about software piracy. An experience like this really does make one question the value of spending money on genuine software. □



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## market directory

## market directory

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# SERVICES PAGE

## LETTERS TO THE EDITOR

WE ARE HAPPY to receive your comments and, if they are of interest to other readers, publish them. Letters will only be considered for publication if they include your name and address, although we can withhold such details from publishing on request. Note that we reserve the right to (and probably will) edit all letters for the sake of brevity, clarity or accuracy.

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ALL PARTS OF tutorials published within the last two years are available as photocopies for a charge of \$1.00 per part, plus \$5.00 for postage and handling within Australia (overseas postage additional). Please identify the tutorial by its complete name and specify the parts by number or the issue of publication. Refer to each year's July issue for our Annual Index of articles.

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## EDITORIAL CONTRIBUTIONS

CONTRIBUTIONS TO *Your Computer* are welcomed and will be given every consideration. We are particularly interested in business orientated applications and articles describing increased productivity gained with a PC – material supplied with good quality 35mm transparencies will be given preference; we cannot accept colour prints for publication (they don't reproduce well). Although the greatest care will be exercised with contributions, no responsibility can be accepted for the safety or return of any letters, manuscripts, photographs or other materials supplied to *Your Computer* magazine. If return is desired, you should include a stamped, self-addressed envelope. If return is critical – say it's something you can't afford to lose – then don't send it; we are careful, but we're not perfect. Please read these notes carefully to get an idea of the style and format we prefer.

**All Contributions:** should include your name, address, and home and office phone numbers. (in case we need to check details). Each page of your submission, and any material sent with it, should also carry your name. Articles that do not include at least contact names and phone numbers for an Australian reseller of any products/services discussed will not be accepted.

**Contributions on Disk:** Contributions can be accepted in most disk formats, although some have to be converted outside our offices, which will add to the (often lengthy) delay between

receipt, acknowledgment and publication. The preferred medium is either 5 1/4 or 3 1/2 or 3-inch IBM standard format disks (any standard density). We can also handle, in-office, Macintosh disks and most other formats, CP/M included, thanks to PC-Alien – so unless you have a particularly strange format, send it on disk straight from your machine (note that we cannot accept 8-inch disks). Please pack them extremely carefully if posting and label all disks with your name, address and phone number. Note that we require both electronic and hard-copy; please include any tables, diagrams and figures in a separate file on disk, with captions, and where they should be inserted in the article clearly marked. If copy cannot be supplied on disk and needs to be keyed in, \$20 per hour for typing will be deducted from payment.

**Listings:** Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error – if the computer typed it, the computer probably accepted it. Print listings with a dark – preferably new – ribbon on white paper, and try to format the output to a narrow (20 characters per inch) width. Please provide an account of what the program does, how it works, why you wrote it, applications you have found for it, and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be enhance likelihood of acceptance for publication. Try to include a printout of at least part of a sample run if possible. Note that space limitations prevent us from accepting for publication, listings over 200 lines long.

**Style:** All items should be printed and double-spaced on plain white paper. We will only accept original copies – no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right hand corner). Be clear and concise, and keep jargon and adjectives to a minimum.

**Rights:** Note that we only accept material on the basis of 'first serial rights' – that means material submitted to *Your Computer* cannot appear in any other publication before the month we publish it; subsequent publication of the material must carry acknowledgment in the form: *First published in Your Computer magazine, [month and year of issue].* Please advise of any other publications to which the material may have been submitted. □

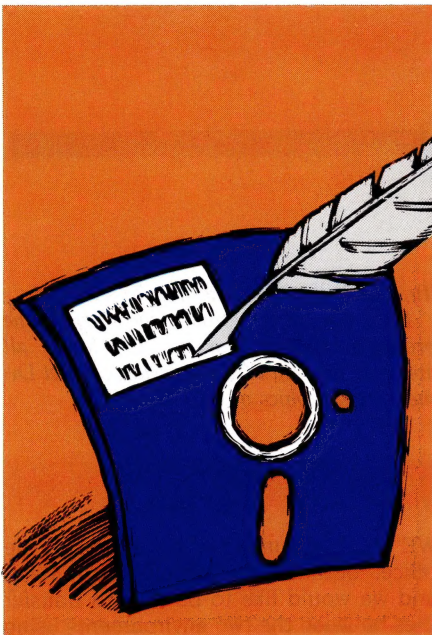
## AD INDEX



Alfa Computers .....	OBC
Alldata .....	IFC,3
Amtec .....	36
Aus-sig .....	45
Autodesk .....	87
AVO .....	74
Babets .....	106,107,124

Business Principles .....	27	Logisoft .....	45	RMK .....	9
Capitol Computers .....	89	Maestro .....	84	Rod Irving Electronics .....	33,58,59
Cathox .....	104	Manacomm .....	92	Sancom .....	75
Datacare .....	111	Microland .....	10,11	Sant Technology .....	17
Dick Smith Electronics .....	52,97	Micro Educational .....	65	Sarwax .....	42,43
Digital Solutions .....	IBC	Napier .....	113	Saxon .....	108
Federal Marketing .....	13,40	Omnipage .....	117	Sharp .....	22,23
Formosa .....	76	Pacific Rim .....	27	Software Express .....	49,60
Frontline .....	29	Pactronics .....	73	Step-up Systems .....	41
Hemdex .....	104	Pelham .....	127	Tatura .....	9
Hypex .....	90,91	Philips .....	34,35	The Computer Factory .....	100
Lazarus .....	127	Pioneer .....	98,99	Vapourware .....	57
Logic Group .....	74	Ramware .....	117	Western Computers .....	25





# WRITE BYTES

## YOUR COMPUTER READERS' FORUM

Here's your chance to air your view or gripe about the computer industry, or to ask about a problem you've been unable to solve. Letters may be edited for space or legal reasons. Write to:

**Write Bytes, Your  
Computer, PO Box 227  
Waterloo 2017 NSW.**

### OS who?

FOR REASONS I have been unable to fathom, my company has recently switched to to PS/2s running OS/2 – and boy, do I miss good old MS-Dos. I guess the main problem is lack of familiarity and confidence with the new operating system. Do you know of any good OS/2 references, particularly one aimed at those wanting to program in it?

**Shelley Fisher  
Woodville, SA.**

The best technical reference we've seen for OS/2 is Peter Norton's Inside OS/2; it's published by Brady and priced at \$49.95 – try any large bookshop with a computer section. The authors, Peter Norton (of Utility fame) and Robert Lafore, comment in the introduction: 'We make very few assumptions about our reader's experience. It's nice if you have programmed in the MS-Dos world, but not essential.'

### Desktop to laptop

I HAVE BEEN a keen reader of Your Computer for some years now, and have always

been impressed with the quality of advice that you have been able to offer to people with computer problems. I hope that you may be able to help me with one that has so far been unanswered by the computer staff at my office.

I have a desktop PC at work and an Amstrad portable at home. I have previously connected the two computers using a null-modem cable and communications software so that I could take files home. I would like to know if it is possible to connect the two computers in some other manner so that the desktop computer will recognise the portable's A: drive as its B: drive, and so that the desktop computer will recognise the portable's built-in modem as a modem attached to itself.

If this could be done it will extend the usefulness of the portable considerably as I will be able to do backups onto 3.5-inch disks, rather than 5.25, and be able to copy files from disk to disk without requiring the use of the modem and comms software.

**W. Palmer  
Canberra**

To access the disk drives on one PC from another is relatively easy, and there are a number of programs which will allow you to do it. The Holland Tunnel is a neat solution (and it is in the public domain). To use the program, a COM file is executed on the slave machine (you cannot use the slave computer while the program is running), and a device driver is loaded on the master computer.

Once this is done, all available drives on the slave machine are assigned drive letters starting from the next available letter on the master machine. If the master has, say, drives A:, B:, and C:, then the first floppy drive on the remote machine will appear as drive D:, and so on. The remote drives are then able to be accessed through Dos as if they were local drives, except that some commands such as Format and Fdisk do not work.

Unfortunately, this facility does not extend to the serial ports because most communications software does not use Dos or BIOS services to access these ports. Also, Dos versions lower than 3.3 only support two serial ports, while most software these days allows at least four, and so it needs to drive the ports directly. This makes it virtually impossible for a program (such as the

Holland Tunnel) to intercept accesses to the serial ports, and re-direct them.

The only real solution to this problem is to write a custom program to run on the laptop, to logically 'connect' the serial port to the modem port, so that the computer appears as a modem to the other computer. However, this is not a really elegant solution, and it cannot run in conjunction with the file transfer program. Even full-blown PC networks have this problem with sharing a modem, and typically make use of a special card installed in each node, which looks like a modem to the communications software, but really re-directs the information over the network to a real modem on the server.

To find the Holland Tunnel, try local bulletin boards. If you don't feel particularly confident, commercial solutions which allow similar access to remote devices include the Brooklyn Bridge and LapLink III (available from PC Extras, (02) 319 2155).

---

One of the most versatile solutions is the DaynaFile system, which is a small box that connects to the SCSI port, and can contain one or two floppy drives.

---

### Fleet management

I AM IN CHARGE of a mixed fleet of small trucks, cars and utes. The biggest problem is getting the drivers to keep accurate log books. We already have an IBM computer system in the office. Is there some way it could be used in place of the log books and perhaps give more information on each vehicle?

**Paul Marshall  
Pennant Hills, NSW.**

Flexible Drive Agencies are selling the Vehicle Black Box – could solve your problem.



# WRITE BYTES

## YOUR COMPUTER READERS' FORUM

The Box automatically monitors such details as driver identification, distance and time driven, average and incremental speeds, and start and finish odometer readings. It can even be programmed to sound an alarm if a pre-programmed speed limit is exceeded. Initial set-up cost is around \$3000 (excluding a PC); the cost is then about \$1000 per vehicle. Keep us informed – we're always looking for good applications stories. Flexible Drive's Sydney number is (02) 550 6466.

### Computer for school work

I AM CONFUSED by the range of computers on the market. I am looking for a machine for my son, who is in primary school, to help him with his school work. If it could also be used around the home for wordprocessing or accounting, this would also be an advantage. Thanks in advance.

**John Mason**  
Loomberah, NSW.

Deciding on a home computers is always a problem. On one hand, you can buy a low-end machine exclusively for games and educational use. However, if you find out later that you want, say, a wordprocessor or spreadsheet, you might find yourself hampered by the lack of a hard disk or suitable software.

Another way to go about it is to buy an inexpensive IBM clone. While this is a little more difficult to set up, and is more expensive initially, it is much more expandable, and you have the advantage of there being a wide range of hardware and software on the market for such machines.

Another alternative is a machine such as an Amiga or Atari. Both have powerful processors (the Motorola 68000), have good graphics capabilities, and are easily expandable with extra memory and disk storage, should you want to use it for more than games. Although these machines do not fit into the IBM PC mould, they have a wide range of software available for them, both commercial products and shareware. Also, because they led the way with their sound and graphics capabilities, many areas of the market have unofficially 'standardised' on them. For example, Atari machines are very popular with musicians, due to their built-in MIDI interface, and the Amiga is often found in graphics applications such as combining live video images with computer graphics.

However, before making any choice – does your son use a computer at school? If so, it is a good idea to buy the same for home. This

can solve many problems and means that he will be able to benefit from the computer much more quickly.

---

*Even full-blown PC networks have this problem with sharing a modem, and typically make use of a special card installed in each node, which looks like a modem to the communications software.*

---

### Scanning 35mm slides

I READ WITH interest your July edition about digital scanners, as I am looking for a machine capable of scanning 35mm slides into a computer. I would like to do that to assist me in the interpretation of aerial photographs for use in agriculture, showing land use and grazing patterns. I would like to find out if there are any significant problems in using 35mm slides for digital conversion, especially regarding resolution, film grain, and so on?

**G. Norton**  
Ivanhoe, Vic.

Sydney company Dimension Graphics markets three different systems which can be used for scanning 35mm slides, depending on the desired results and the available budget. The first is to use a color scanner, such as one of the Sharp models, which have an optional attachment for scanning 35mm transparencies (and larger sizes, too).

The second possibility is to use a video camera and video capture board, such as a Targa or Vista board from Truevision. For best results, there is the BarneyScan, which is a dedicated 35mm slide scanner. However, for this solution, you are looking at a price of about \$15,000. The images can be saved in a variety of standard file formats, for later retrieval.

As far as the benefits of slides versus prints, we have found that for illustrations in Your Computer, slides reproduce much better than prints. Prints tend to lack clar-

ity, especially if they need to be enlarged.

For more information about any of the products mentioned above, which are all available for both PCs and Macs, contact Dimension Graphics on (02) 929 5855.

### Mac to PC and back

WE HAVE A number of computers in the office, both PC-compatibles and Macs, and we would like to be able to transfer files between the two environments using floppy disks. Is there an easy way to do this?

**John Farrell**  
Victoria Park, WA.

There are several ways to share files between PCs and Macs, but for occasional file transfers, the easiest solution is to install a 'foreign' floppy drive on one of the machines – either a Mac drive on a PC, or vice versa. There is a very handy board for the PC called the Copy II PC Deluxe Option Board. As the name implies, it is designed for making accurate copies of copy-protected disks, but as a bonus, it is able to read and write Mac disks with the aid of software supplied with the board. The beauty of this system is that it uses an existing 3.5-inch drive, if you have one, and when the Mac conversion software isn't running, the drive operates as a normal Dos drive.

Tackling the problem from the opposite angle, you can add a Dos-compatible drive to the Mac. One of the most versatile solutions is the DaynaFile system, which is a small box that connects to the SCSI port, and can contain one or two floppy drives – either 5.25- or 3.5-inch. When a disk is inserted into the DaynaFile drive, it appears as another drive icon on the desktop, and can be manipulated in the same way as any other Mac drive.

Of course, if you have one of the newer model Macs, with the FDHD floppy drive, then you can read and write 3.5-inch Dos disks using the Apple File Exchange program. All you need then is a standard 3.5-inch drive (either a 720K or 1.44Mb unit) on the PC, and file transferring is as simple as swapping disks. The DaynaFile people also have a program called DosMount, which automatically recognises a Dos disk as soon as it is inserted into the FDHD drive on a suitably-equipped Mac, without needing to use Apple File Exchange.

The Copy II PC Deluxe Option Board is available from Software Express on (03) 663 6580. For the DaynaFile, try City Personal Computers on (02) 264 8011.





## Caution: Most local area networks gobble up huge amounts of RAM

Some folks invest in a network, then find out it uses so much RAM they can't run important applications programs – like wordprocessors, databases and spreadsheets.

That is, unless they're willing to spend hundreds more per network computer on extended memory boards. And the programs to run them.

May we suggest a much simpler, far less expensive alternative: Artisoft's LANtastic.

LANtastic uses less than 40K of RAM on a server and under 12K on a workstation.

And that's an amazingly small amount of RAM! Especially when you consider that LANtastic delivers DOS 3.1 file and record locking, two levels of security, printer sharing, disk sharing, file and program sharing, audit trails, NetBIOS-compatibility, CD-ROM support and much more.

And because of LANtastic's tiny RAM requirements, you can run its network

operating system in base memory and still have plenty left over for your programs.

Best of all, the LANtastic Network Operating System is available with 2 Mbps adapters (\$430/node), Ethernet adapters (\$587/node), in a serial and parallel port version, and in an adapter-independent version that runs on other manufacturer's adapter cards.



EDITOR'S CHOICE  
LANtastic  
March 28, 1989

No wonder PC Magazine gave their prestigious Editor's Choice Award to

LANtastic over Novell ELS and TOPS. And Byte Magazine wrote: "LANtastic is . . . a lot of LAN bang for the buck."



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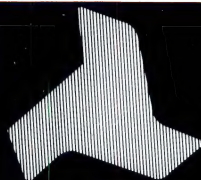
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